

DEPARTMENT OF EDUCATION, HEALTH AND LANDS.

[Fifth) Report showing the progress made in giving effect to the recommendations of the Royal Commission on Agriculture in India during the calendar years 1934 and 1935.

PART II.—LOCAL GOVERNMENTS AND ADMINISTRATIONS.

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PART II.—Local Governments and Administrations.

Statement showing the progress made by Local Governments and Administrations in giving effect to the recommendations of the Royal Commission on Agriculture in India, with which they are concerned, during the calendar years 1934 and 1935.

N. B.—Provinces which are not specifically mentioned against a particular recommendation have nothing new to report. The provinces have been arranged alphabetically.

CHAPTER III.—Organisation of Agricultural Research.

1. Constitution of Provincial Committees to co-operate with the Council of Agricultural Research (paragraph 57).

Assam.—The Provincial Agricultural Research Committee continued to function. The views of the Committee on the various schemes were forwarded to the Imperial Council of Agricultural Research.

Bihar and Orissa.—The Provincial Agricultural Research Committee approved of the following schemes of Research:—

- (1) Scheme on the determination of nutrient content in the Indian Soil.
- (2) Scheme on the feeding of minerals to cattle.

The following schemes have been sanctioned by the Imperial Council of Agricultural Research, but await allotment of funds:—

- (1) Investigation on the economics of tube-well irrigation.
- (2) Scheme on Sunn-hemp.
- (3) Scheme on the feeding of minerals to cattle.

The following schemes await consideration by the Imperial Council of Agricultural Research:—

- (i) Potato Storage Scheme.
- (ii) Schemes on biochemistry of rice.

The following new schemes were sanctioned by the Imperial Council of Agricultural Research during the years under review and have come into operation:—

- (a) Fruit Research scheme at Sabour (Bhagalpur) for the purpose of carrying out investigational work on the fruits of the plains of United Provinces and Bihar.
- (b) Scheme for investigating the malting and brewing qualities of improved Bihar barleys.
- (c) Scheme for investigating the possibilities of manufacturing Khandsari sugar by the single pan method.
- (d) For research work on cigarette tobacco a sum of Rs. 2,500 has been sanctioned by the Imperial Council of Agricultural Research for the erection of a pair of flue-curing barns at Sabour.

The following old research schemes were continued:—

- (1) The Sugarcane Research Station at Mushari (Muzaffarpur) with its sub-station at Patna.
- (2) The Rice Research Station at Sabour with its sub-stations at Cuttack, Kanke and Gaya.
- (B) Economic Enquiry into the cost of production of sugarcane and the crops grown in rotation with it.

Bombay.—Schemes for submission to the Imperial Council of Agricultural Research from Sind are at present considered by the Sind Research Committee, under the Chairmanship of the Commissioner in Sind, and by the Bombay Provincial Research Committee. Owing to the separation of Sind from the Bombay Presidency with effect from 1st April 1936, the question of the formation of a Sind Provincial Research Committee will be taken up with a view to co-operating with the Imperial Council of Agricultural Research.

Madras.—The Provincial Research Committee constituted in the place of the committee of non-officials continued to function as in the previous years.

North-West Frontier Province.—A committee has been formed but has not yet met. Owing to the small size of the Province it is doubtful whether there is any real need for such a committee.

United Provinces.—The United Provinces Agricultural Research Committee, which was established in 1929, met four times during the last two years.

Three departmental schemes, financed by the Imperial Council of Agricultural Research, were in operation at the beginning of 1934. Nine new schemes were sanctioned during 1934 and 1935, but only six were brought into operation, so that nine schemes were in operation at the close of 1935. In addition, nine non-departmental schemes were sanctioned during the last two years.

CHAPTER IV.—Agricultural Improvement.

2. Progress of research work on soils and soil conditions (paragraph 78).

Assam.—The post of Agricultural Chemist remains in abeyance. A second Chemical Assistant has been appointed for Sugarcane Research, under the Imperial Council of Agricultural Research's Scheme.

Studies in the acidity of old alluvial soils continued. Sunn hemp was found to die early in an acidity of 1,070 parts CaO per million parts soil (Hopkin's method). It grew fairly well in an acidity of 440 parts CaO. The difference in the acidity of the two soils was found to be associated with a difference in the amount of plant food, the more acidic soil being distinctly the poorer of the two. Examination of riparian soils confirmed results already reported. Even sub-soils consisting of about 80 per cent. sand were found to contain high percentages of Phosphoric Acid. The soils were also fairly rich in nitrogen and potash.

A number of soil samples from the Shillong Fruit Garden and other localities were analysed.

A uniformity trial with sugarcane was taken up on two acres of land at the Jorhat Farm to determine the fertility gradient of the soil. Another such experiment was conducted with rice at Kaumrang to ascertain the suitable size and number of replications of experimental plots.

Bengal.—A scheme for the investigation into soil physics has been financed by the Imperial Council of Agricultural Research and has been in operation since 1932. Studies on soil deficiency and of its improvement are being carried out at the Chemical Section of the Agricultural Department. Investigation into the manurial value of the Damodar Canal silt was of special interest during the period under report.

Bihar and Orissa.—Soil survey on agricultural basis but with a very limited scope has been started at the Chemical Section. The Departmental Farms are being used as nuclei for the survey of the tracts in which they are situated. 50 miles unit is the basis of their rapid survey and the soil samples are being examined for their chief chemical and physical properties.

Work has been started on the purification and properties of substituted and partially substituted clays and their structure as determined by the X-ray analysis. The work on the reclamation of alkaline soil in Satara is continuing. The effect of chemical corrections in controlling and regulating base-exchange, soluble salt concentrations and the reaction of the alkali soils, is being investigated. Progress has been made in the work of counter-acting the bad effect of saline soil in Orissa on the cane juice and gur. Gypsum and cyanamide have proved useful.

The effect of C/N ratio of the organic matter in determining its decomposition in the soil is under study. The effect of addition of large quantities of white molasses from sugar factories on the physical and chemical properties of the soil is under investigation.

The effect of heat on the soil in general and on the seed bed for paddy in particular is being fully investigated. The performance of seedlings grown under various heating conditions in an unmanured medium is being tested in pots.

Comparative study of the different methods of determining plant nutrients in the soil is being made with Bihar soil in the first instance and will be extended to other soils.

Bombay.—In the Presidency proper, a genetic soil survey on the Russian system has been undertaken by the Soil Physicist at the Sugarcane Research Station, Padegaon. The canal areas of the Nira Right Bank and Pravara which spread over three districts—Satara, Sholapur and Ahmednagar—have been fully surveyed. Eight different types of soil have been classified and a full study of physico-chemical characteristics and colloids has been completed. This type of survey gives information as to the probable behaviour of soils under irrigation. A soil fertility survey has also been completed on the Nira Left Bank and Godavari canals to study the effects of irrigation over long periods. Two new types of soil deteriorations are observed in this connection, namely due to (i) high C/N ratio, (ii) high exchange sodium in soils. Studies of methods of reclaiming soils and maintaining fertility by means of fallows, green manure crops and weed burying under irrigation and crop growing are in progress.

In Sind, the sub-soil survey to determine the danger of the occurrence of water-logging and alkaline formation in the soils of the Barrage areas has been completed by the Research and Development Division of the Irrigation Department. A scheme to ensure the continuance of regular observations of sub-soil water levels in the Barrage areas has been prepared and submitted to the Imperial Council of Agricultural Research for financial provision through the Sind Research Committee and the Bombay Provincial Research Committee. The Imperial Council of Agricultural Research has approved a scheme for investigation into the micro-flora of saline soils in Sind. With the establishment of a Right Bank Research Station at Dokri, which has been sanctioned by the Government of India, detailed research work on soils and soil conditions in the Barrage Right Bank tract will be undertaken.

Madras.—The systematic study of soils of the Agricultural Research stations was continued. Besides this, work on base exchange, study of clay fractions and the relationship between the physical properties and the composition of soils, as also soil moisture experiments, were in progress. Soil surveys were undertaken of four irrigation projects, viz., (1) Lower Bhavani, (2) Cauvery-Mettur, (3) Tungabhadra, and (4) Toludur.

North-West Frontier Province.—Last year for the first time the Agricultural Department of the Province was in possession of its own chemical laboratory for soil analysis.

Punjab.—Research work on soils and soil conditions continues. Research was carried out on silt and silt-laden water from the Sarda distributaries, and the analysis showed that this silt contains all the important plant foods and approximates in composition to arable sandy soil, and can thus be used advantageously in lightening clay soil.

3. Soil erosion (paragraph 79).

Andamans.—Advice has freely been given to owners of coconut plantations and other holdings situated on hilly land to carry out terracing and contour-bunding so as to check soil erosion.

Bihar and Orissa.—There is nothing to add to the previous reports except that as a result of the lay-out adopted at the Hathwar Farm in the district of Manbhum a steady improvement is being observed in the conditions of the uplands which are now getting steadily better, whereas before they were drained they were getting steadily poorer.

Bombay.—Although the post of the Bunding Officer in the North-Central Division was retrenched, some work was done through the agency of the district staff and this has been received well by the public. Special work on soil erosion is being taken up under the Rural Uplift Schemes.

In the South-Central Division, the post of the Bunding Officer was held in abeyance from 1st March 1931 to 31st March 1935, and hence special activities of land development could not be undertaken. The routine work of rendering technical advice about land development was done by the District Agricultural Overseer and about 30 applications for a loan of Rs. 5,000 were attended to by the Overseer. The post of the Bunding Officer was again revived from 1st April 1935.

In spite of the fact that the post of the Bunding Officer in the Southern Division has been long since retrenched, a Graduate Assistant from the district staff has been engaged to prepare plans and estimates of important works. The regular staff of the District Agricultural Overseers inspected the existing works and rendered whatever guidance was possible to the cultivators. In all 45 applications for advice were received costing about Rs. 8,000. Of these, 22 schemes extending over an area of 260 acres and costing about Rs. 4,000, required tagai loans and the remaining 23 schemes extending over an area of 840 acres and costing about Rs. 4,000, were executed from private capital.

In the programme of work of the Bombay Dry-Farming Research Scheme, experiments have been laid down to determine the extent to which erosion takes place in these areas of precarious rainfall. Eight different treatments of the land are being compared for testing the varying degrees to which erosion goes on. During the year 1934, the rainfall at Sholapur was much below the average and the distribution was different from the normal. Under these conditions erosion was limited. But during the year 1935, the rainfall was nearly normal including heavy and sudden downpours. The result was that very large quantities of soil were lost by erosion.

Punjab.—On the recommendation of the Punjab Erosion Committee, 1932, an Imperial Forest Officer with a small staff has been on special duty since March 1934, to assist the Deputy Commissioners of the Hoshiarpur and Ambala districts in preserving and increasing forest growth and vegetation in the Siwalik hills, which are threatened with complete denudation. Similarly, a special staff is employed in Gurgaon to check denudation and erosion there. And now a conference is about to be held to review the whole problem and to consider what further measures can be adopted, particularly in the Salt Range and adjacent districts.

United Provinces.—An area of 90 acres on the banks of the Jumna and the Chambal which had lost all agricultural value by the formation of a net work of ravines, has been treated and provided with bundhis. It is hoped that it will be possible to expand this work with the help of tractors.

4. Work on fertilisers (paragraphs 80—93).

Andamans.—The general fall in the prices of agricultural products makes the use of fertilisers prohibitive so that fertilisers cannot be recommended for use on plantations or field crops.

Assam.—At Jorhat experiments on sugarcane were conducted with various manures and fertilizers, and with different doses of farm yard manure. In ratoon cane, ammoniophos, oilcake, ammoniophos *plus* oilcake gave good results; muriate of potash gave a better quality of juice than oilcake or super. Super gave the lowest quantity of sucrose and the poorest quality of juice. In plant cane minute of potash gave higher outturn of sucrose and better quality of juice than either oil cake or super.

At Titabar, the residual effect of previous manurial treatments on rice was studied. Several treatments gave significant increases over the control in the first year, the highest being with cowdung *plus* super followed by ammoniophos.

At Karimganj experiments on rice pointed to the inadvisability of applying manures and fertilizers to land subject to inundation and naturally rich.

In a manurial experiment on potato with artificial fertilizers, ammoniophos with sulphate of potash gave the highest increase of 68.2 per cent over the control. Sodium nitrate gave negative results. The treatments containing potash in all cases gave significantly higher yields than those containing no potash.

The use of oilcake as a manure for sugarcane was successfully demonstrated on cultivators' fields. Manurial experiments with fertilizers on pine apples were taken up in private gardens. Attempt to increase the local supply of manure by utilizing water hyacinth, growing green manuring crops and preparing compost continued.

Baluchistan.—Only one block under apples planted 3 years ago is being treated with chemical fertilisers.

Bengal.—Experiments with various manures such as Nuphos, Ammonium Sulphate, Green manure, etc., have been carried out as usual on Government farms.

Bihar and Orissa.—Work is in progress on the effect of time of application of easily available Nitrogen on yield and quality of grain crops. Wheat, barley, paddy and sugar cane are under test.

The intake of Nitrogen for organic and inorganic fertilisers, as influenced by the addition of varying doses of phosphoric acid is being investigated.

Molasses, a waste product of sugar factories, is being tried for its manurial value on various crops.

A good manure has been prepared by the Indore method by composting habitation wastes with night soil. Experiments are in progress on its manurial value as compared to farm yard manure.

Work is in progress on the disintegration of bones by composting them with sulphate of ammonia, farm yard manure, etc., with a view to the utilization of the bones as a cheap source of phosphoric acid for fertilising purposes.

'Compost factories' are now a regular feature in every farm and all available decomposable organic matter is being utilised for this purpose. Compost making is now one of the most important items in the propaganda work of the Agricultural Department.

Bombay.—In the North-Central Division manuring of cotton with both bulky and concentrated fertilisers was further studied. In the case of rice, manuring with oil-cake besides sulphate of ammonia was studied with hopeful results. The use of sulphate of ammonia for dry crop wheat is being studied.

The manufacture of compost is being studied at several experimental stations. The use of charred bones is also being introduced.

The use of kaim as green manure is being pushed on in the wheat tract of Khindesh.

Most of the Taluka Development Associations have been dealing in fertilisers, especially sulphate of ammonia, and the use of this stuff is increasing.

In the South-Central Division, the work mentioned in the Report of the year 1932 and 1933 was further carried on and the following quantities of fertilisers were distributed during the years:—

Name of the Fertilisers.	Quantity, 1934	Quantity, 1935.
	lbs.	lbs.
Sulphate of ammonia	2,690,608	2,151,476
Nitrofos	30,115	236,000
Sulphate of potash	20,220	10,180
Nitrate of soda	2,290	500
Superphosphate	5,020	2,840
Oil-cakes	5,003,666	6,024,000
Bonomeal	27,440	32,020
	mds.	mds.
Denatured salt	1,425	2,050

During the year 1934, 75,000 lbs. of sann seed were distributed, while during the year 1935, 50,000 lbs. of seed were distributed. The distribution of this seed has now been taken up by several private agencies as the cultivators have understood the advantages of the sann green manuring.

In Gujarat, experiments with 'Dhaincha' as green manure on the Surat and Broach farms are in progress. The results are promising as it thrives better on black cotton soils than sann (*Crotalaria juncea*). The economics of the manuring of cotton with sulphate of ammonia is being worked out on the Surat and Broach farms. So far the results obtained at Broach are promising. The use of sulphate of ammonia, oil-cake and sann is now popularised for rice and sugarcane crops and cultivators are using these freely. Private trade is now well established in these manures.

In the Southern Division, the prices of gul have not improved to any marked extent so as to give any noticeable encouragement to the use of artificial manures for the sugarcane crop. Even so, the use of sulphate of ammonia and oil-cake for sugarcane is becoming extensively popular and local agencies have taken up the distribution of the same. The use of bonemeal for the paddy crop is slowly but surely extending, and a local factory at Dharwar has now taken up the preparation of bonemeal for general supply in the tract. All municipalities are trying to prepare poudrette and farmers are realizing the great use of this valuable manure near big towns. Efforts to demonstrate the proper methods of preparing farmyard manure in the different tracts continued.

At the Sugarcane Research Station, Padegnon, the physiology of sugarcane has been studied for the last three years. Study of the cane crop at different stages during its life period has thrown light on the requirement of plant food, water and their co-relation with climate. Similarly, studies were concentrated on the utility of different artificial and organic manures including molasses and compost. As a result of this, new types of experiment on the use of different quantities of mixture of artificial and organic manure, different periods of application have been laid down to suit the cane crop. The utility of sann green manure is definitely proved and similarly the necessity of addition of phosphate to increase yields has been proved. Studies on the actual quantities of phosphate in the form of bonemeal and superphosphate are in progress. Besides sann, other green manure crops are under study.

In Sind manurial experiments are being carried out on cotton, wheat, sugarcane, potatoes, chillies and onions. Most of the experimental work is being done at the Agricultural Research Station, Sakrand, and at the Government Seed Farm, Mirpurkhas, and the experiments are conducted in co-operation with Imperial Chemicals (India) Limited.

Experimental work on the most effective and economical method of manufacturing organic manure, i.e., compost, from waste organic materials, e.g., crop residues, has been completed at the Agricultural Research Station, Sakrand. The method is being demonstrated on Government Auxiliary Farms in the districts.

The Agricultural Department in Sind is conducting a special series of demonstration plots on zamindars' lands in the districts to bring to the notice of cultivators the methods and advantages of the cultivation of green manure crops. Government have issued orders exempting certain crops, grown as green manure crops in both the kharif and rabi seasons, from payment of land and water assessment. This concession is subject to regulations regarding notification of cultivation of such green manure crops to the Irrigation authorities and to the crops being ploughed in the land before a fixed date each season. A further concession permitting cultivators to take one cutting from a green manure crop for fodder purposes, on payment of Re. 1 per acre, has been granted with the object of encouraging harris i.e., tenants, to cultivate such crops on their lands.

Madras.—Work was started to find out the best and the cheapest method of converting bone into fine bone-meal so that bone-meal can be prepared in villages and used as manure on a larger scale than now. Light charring of the bones by heat rendered them sufficiently brittle to be broken into pieces when crushed between stones. Experiments on the composting of night-soil and converting it into an odourless manure with the road sweepings were in progress. Movements and distribution of soil moisture and P.H. values of several samples of soil from the Presidency were under study. Efforts were made to utilize the effluent from the activated sludge plant installed at the Agricultural College, Coimbatore.

The scheme of research for developing the fish manure meal and oil industry came before the Governing Body of the Imperial Council of Agricultural Research at its meeting held on 21st January 1935. The Governing Body, however, postponed further consideration of the scheme till full facts on the continuance of the survey of deep sea fishing resources were received from the Madras Government. The Council appeared to be under the misapprehension that without a large supply of fish which could be made available only through an intensive exploitation of the deep sea fisheries there would be no scope for the proposed development of the guano industry. In reply, the Madras Government informed the Council, in September 1935, that (1) even without the development of the deep sea fisheries there is, on an average, a sufficient surplus, over and above local food requirements, of certain classes of cheap shoaling fish suitable for conversion into fish guano and manure, (2) that the Madras Government is interested in the development of deep sea fisheries and is continuing the investigation in that direction and (3) that the

manufacture of fish oil and manure is, admittedly, chiefly conditioned by the presence of the sardine in sufficient quantities and that the causes for the periodical absence of this fish from the inshore waters of the West Coast are a constant subject of study. In the circumstances, the Madras Government urged a favourable consideration of the scheme.

North-West Frontier Province.—Extensive experiments of composting and green manuring have been carried out for fruit orchards. Green manuring in combination with Phosphates has been shown to be the best treatment.

Manurial tests have shown that the silt brought down by the hill torrents has a high manurial value. It appears that 4 tons of such silt is equivalent to one ton of Farmyard manure. Extensive use of such silts is possible in several areas. The silt from the Bara river owing to absence of sand has the highest manurial value.

The blood from the slaughter houses at Peshawar has been thrown away for the last 4 years. An economic method of converting the blood into a dried form by the use of lime instead of the expensive method of heating has been devised. The manure is being used on Government farms and for sale to zamindars.

The Royal Commission on Agriculture made a recommendation that the possibility of processing bones should be investigated and also the phosphate requirements of Indian soil. A method has been devised whereby the insoluble tri-calcic phosphate in bones is converted into the di-calcic or citric soluble form by mixing with Potassium Nitrate in the form of crude shora (saltpetre). A manure is obtained with 7 per cent of Nitrogen in organic and inorganic forms, 16 per cent of K_2O , citric soluble, and 7 per cent of K_2O . Arrangements have been made (by the Agricultural Department) to manufacture this manure and sell it at a cost of Rs. 2 per maund. The manure has been tried against Nicotif which is sold by the Imperial Chemical Industries at Rs. 6 a maund and has given level results. At Rs. 2 a maund this manure should give over 100 per cent. return in increased yields.

United Provinces—Experiments are in progress to ascertain the extent of the utility of the various kinds of artificial fertilizers. No general programme of experiment to ascertain exactly the extent to which fertilizers can profitably be used can be formulated to meet the different local conditions, but a programme is chalked out for each Government farm which includes the utilization of manure to the best advantage in the locality. As a result, the Agriculture Department is now in a position to give advice to the cultivator in regard to the economic use of certain fertilizers.

The systematic utilization of all forms of vegetable and animal wastes as manure has been established as a permanent farm practice on all Government farms, and the process for compost making has been simplified and demonstrated to a number of the larger landlords.

Considerable experimental work has been done on green manuring and active propaganda has been carried on to popularise green manuring where conditions are favourable. The role of leguminous crops in the general farm rotation has been widely demonstrated and facilities are provided to supply the seed of such crops on easy terms.

The demand for artificial fertilizers has increased, chiefly for the sugarcane crop. About 12,000 maunds of castor cake mixed with ammonium sulphate were used as manure for sugarcane. Steps are now being taken to supply 60,000 maunds. The quantity of other kinds of manure distributed increased to 78,551 maunds in 1933-34 and to 89,541 maunds in 1934-35.

There was an increase in the number of co-operative societies for the storing of farmyard manure in pits, outside the residential area.

5. Introduction of improved varieties of Crops (paragraphs 97—103).

Andamans.—The introduction of tested varieties of sugarcane, sesamum, dal arhar, etc., from India and Burma was continued. Several improved strains of paddy were imported from the Agricultural Department, Burma, and were grown on the Departmental Farm and issued to cultivators in the following season.

In particular the Department worked a small area of land in the area reclaimed from the sea with a view to examining the possibilities of obtaining a paddy crop off this. Varieties of paddy reputed to withstand a certain amount of salt in the soil, were imported from Burma. The yield was very small in the first year and the second year's cultivation resulted in complete failure. The experiment has been repeated in the current year with the same varieties as well as early maturing varieties in order to ascertain whether early maturing varieties will be able to withstand the salt conditions. So far the experiment has progressed well.

Three early maturing varieties of paddy were also imported for the purposes of obtaining a double crop of paddy off the land. These have come under distribution only in the last year and will probably become popular with the cultivators who fully realise the possibilities of such early maturing crops.

Assam.—Work on pure line selection and crossbreeding of rice continued at the Karimganj and Titabar farms. A large number of types were under preliminary and final varietal trials in different classes of rice. At Karimganj three pure line selections proved superior to others in their respective classes. Several hybrids were found promising at both the farms. Demonstrations with previously recommended varieties have been going on.

At Jorhat, work on the selection of sugarcane continued. The selections made during the two years under report were Cos. 358, 402, 407, 408, 410, 413 (1934), 361 and 408 (1935). Besides a number of other promising varieties are awaiting final trial.

Work with potatoes continued on the lines previously reported.

Other works on crops include variety trials with linseed, matikalni, arhar and a few fodder grasses. Linseed was grown in cultivators' fields with success in various parts of Lower Assam. Groundnuts grown as a rabi crop in inundated parts and as a kharif crop in other parts of Goalpara promised well.

Baluchistan.—Improved varieties of wheat (C.P.H. 47 and A.T. 38) and cotton (Cotton Desi 27 W. N. & American Cotton 289 F and 285 F) have been introduced.

Bengal.—Researches into trade rice were conducted at Bankura, Bibhum and Chinai with the financial aid from the Imperial Council of Agricultural Research. The main objects of this work are—

- (1) Improvement of the quality and yield of the most important types of rice suitable for these tracts.
- (2) Improvement of the Patnai rice of the Sundarbans in particular, with special attention to (a) its commercial possibilities and (b) its capabilities under inland conditions.
- (3) Improvement of trade paddies other than Patnai which commonly go under the name of "Bengals."
- (4) Introduction and extension of such improved strains with a view to produce an exportable surplus.
- (5) To investigate the possibilities of increasing the trade in rice with other countries.

In addition, the departmental selected varieties of jute and paddy have made much headway almost in every locality. Co. 218 sugarcane is also fast replacing the local varieties. Its cultivation is also spreading rapidly as a substitute for jute crop. Pollachi red bunch type of groundnut imported from Madras is also gaining ground as a substitute crop. Experiments are also being made with several types of sugarcane at the sugarcane seedling testing station at Dacca.

Napier grass as a fodder crop and new fibres such as Hibiscus Sabdarifa var Altissima and agave were also introduced in certain tracts.

Bihaar and Orissa.—Systematic yield trials of new gram hybrids against the standard variety, Sabour type 4, were continued. Besides several other yield trials, e.g., of the best Pusa types of wheat, gram, pigeon pea (arhar), linseed against our best types were continued.

Large quantities of seeds of tested varieties of improved crops were supplied to the cultivators who are appreciating to an increasing extent the superior merits of these varieties.

Bombay.—Under the scheme financed by the Indian Central Cotton Committee, 520,778 lbs. of Banilla cotton seed were distributed in stages III and IV and 815,272 lbs. were made available for general distribution in stage V in the North-Central Division. It is estimated that as a result of the working of the Committee's seed scheme and other agencies of seed distribution, the total area under Banilla cotton in Khandesh and Nasik is about 125,000 acres. To meet the growing demand for improved seed of wheat, rice and bajri in the North-Central Division, a chain of seed farms owned by private agencies was started in 1934 for the multiplication of seed. They have worked satisfactorily also in 1935. Besides these, seeds of Spanish peanut and other varieties of groundnut and improved varieties of sugarcane were distributed in the East and West Khandesh and Nasik districts.

In the South-Central Division, during the year 1934, the area under Pusa wheat No. 4 was 2,000 acres and about 9,000 lbs. of fresh seed were distributed. During the year 1935, the area has increased to 10,000 acres and about 12,000 lbs. of fresh seed were supplied. The advantage of Pusa No. 4 wheat is now well known to cultivators.

Jowar Breeding at Mohol.—The work of breeding jowar varieties known as 'Maldandi' and 'Dagadi' was continued and the following varieties have been evolved.—

'Maldandi' No. 47-8 and 85-1.

'Nagar Dagadi' No. 8-50.

'Bijapur Dagadi' No. 24, 29 and 84.

Trials of these varieties in the Sholapur, Ahmednagar and Bijapur districts are going on and the results are encouraging.

Improved varieties of sugarcane.—During the last two years, substantial progress was made in the introduction of new varieties like 'P O J. 2878,' 'E K 28,' and 'Co 290' and the Agricultural Department has distributed the following sets of these varieties during the two years:—

Name of the variety.	Year 1934. Sets.	Year 1935- Sets.
'P O J. 2878'	250,000	200,000
'E K 28'	550,750	250,000
'Co. 290'	20,000	7,500
'Co. 360'	2,000

It may be interesting to note that during the year 1935, the following areas have been planted with these varieties:—

Variety.	Area of the cultivators.	Area of the factories.
'E.K. 28'	1,200	3,300
'P.O.J. 2878'	175	2,500
'Co. 290'	75	1,400
'H.M. 320'	100

Introduction of "Banilla" Cotton Seed.—During the two years, a special attempt was made to raise pure Banilla seed on the Kopergaon Farm with the help of the Indian Central Cotton Committee. 30 acres of pure 'Banilla' cotton are grown on this farm and its pure seed to the extent of 20,750 lbs. was distributed in 1934. In 1935, about 18,000 lbs. of seed was distributed to the registered seed-growers for an area of nearly 1,000 acres and it is expected that during the coming year most of the cotton area on the Deccan Canals will be under Banilla cotton. It is gratifying to note that the scheme of the Kopergaon seed farm is self-supporting.

Introduction of tobacco crop in the Konkan.—The work is further continued, but special progress cannot be made for want of good prices for tobacco. At present there are about 100 acres under the tobacco crop in the Ratnagiri District.

Improvement of Rice.—During the year 1934, 6,900 lbs. of 'Panvel No 61,' 'Kolamba Nos. 184, 401 and 42' were distributed to the registered seed-growers for an area of 150 acres. The crop was spoiled by unexpectedly heavy rains and 60,000 lbs. of seed sufficient for 1,200 acres were available. During the year 1935, again 6,766 lbs. of improved rice strains of 'Patni 6,' 'Kudai 25,' 'Panvel 61' and 'Kolamba Nos. 184, 401 and 42' were distributed to the registered seed-growers for an area of 185 acres. From these seed-growers, 180,000 lbs. of seed sufficient for more than 3,000 acres were available.

Improved Nagli Strains.—During 1934, 2,800 lbs. of seed of improved varieties were supplied for 300 acres from which only 7,000 lbs. of good seed were available. This was sufficient for 1,000 acres. During the year 1935 again 1,400 lbs. of seed of these varieties sufficient for 100 acres were supplied and the produce of 25,000 lbs. was distributed for 3,000 acres in the Ratnagiri District.

Akola Bajri.—During the year 1934, 10,400 lbs. of 'Akola Bajri' were distributed, while during the year 1935, 7,500 lbs. of 'Akola Bajri' were supplied.

In the Southern Division, the two improved varieties of cotton are fast replacing the local inferior types. 'Jayawant' covered an area of 101,389 acres in 1934 and 240,236 acres in 1935, and 'Gadag No. 1' covered an area of 90,231 acres in 1934 and 92,100 acres in 1935. Supply of selfed seed for the different seed schemes of 'Jayawant' continued to be raised on the Dharwar Farm, but, as the Gadag Seed Farm was abolished, a special arrangement with a private farmer was made at Gadag whereby selfed seed could be raised under direct supervision of the Department. The Cotton Breeder has made progress in his selection of still better strains in both these types. He continued his selection work in groundnut and gram, seeking higher yields in the first case and wilt resistance in the latter. The Seed Multiplication Scheme taken up for securing adequate supply of pure seed of the six paddy strains selected by the Rice Breeder continue to be in operation and these strains covered an area of about 7,500 acres. Selection work on 'Dodgya' variety was continued. 'Java 213' cane was introduced in many parts of the Mallad tract of the Dharwar and Belgaum districts and H. M. 544 cane in parts of the Kanara District. The area covered by these two varieties was about 400 acres.

In Gujarat the introduction of 1027 A. L. F. cotton seed in the tract south of the river Nerbudda was continued. During these years, as in the past, the seed distributed was 23,12,800 lbs. and 11,18,900 lbs. in the years 1934 and 1935, respectively. The total area under cotton in this tract is now nearly 6 lakhs of acres and of this nearly 4½ lakhs is estimated to be under "1027 A. L. F."

"B. D 8" cotton which is wilt-resistant and spins even better than Sural 1027 A. L. F. cotton has been tried in the Broach District for the last 4 years, and it is finding favour with the cultivators. In 1935 it was estimated to occupy about 4,000 acres. The Indian Central Cotton Committee has recently sanctioned a scheme to organise the seed distribution of this cotton at a cost of Rs. 10,460 for three years and it is hoped to spread this cotton on a large scale in the near future, if the cotton market supports its sale in a reasonable way.

"Co. 213" variety of sugarcane has been recently introduced and its cultivation is spreading very rapidly, especially, in the Kaira and Panch Mahals districts where it is estimated to occupy nearly 4,000 acres in 1935.

"Budh Perio Jowar No. 58" which is a better yielder than the local variety is being introduced in the Surat District and in 1935, 21,000 lbs. of this seed were distributed to the cultivators.

Improved varieties of tobacco, *viz.*, "Gandiu No. 6", "Piliu No. 28" and "Keliu", are introduced in the Kaira District, and during 1935, 120 lbs. of seed of these types were distributed in the district.

Improved paddy varieties, *viz.*, "K. 79" and "K. 184" are introduced in several places in the Division and they are found suitable in some areas.

Wheat No. 224 has been introduced in the Broach and Ahmedabad districts. It is found a better yielder and its cultivation is spreading in these districts.

"Pusa Wheat No. 4" has been introduced in the Panch Mahals District and has established there now. This wheat is also introduced in other parts of Gujarat where it is grown under irrigation.

The groundnut crop has been introduced in Gujarat during the last 15 years or so; it has established itself in several parts of the country. "Spanish peanut" has been found suitable in the Panch Mahals, while "Big Japan" has been found suitable in other districts.

At the Sugarcane Research Station, Padegaon, nearly sixty-two selections of "Coimbatore" canes were received. "Co. 360" has shown promising results and is under trial in cultivator's conditions. "Co. 290" is the next variety which has shown good yields. "H. M. 89" from Hebbal, Mysore, is also under trial under cultivator's conditions. Other varieties, which are prominent, are "Co. 410," "Co. 413," "Co. 408," "Co. 417," and "Co. 416" and will be liberated for trial in 1937 under cultivator's conditions. Systematic trials are conducted on these new selections on the new lines of experiment.

In Sind the progress of scientific research work on the improvement of crops and the introduction and extension of such improved varieties of crops into general cultivation in the districts has been fully maintained. Organised schemes for the multiplication and distribution of pure seed of improved varieties of cotton, wheat, rice and jowar are being carried out by the staff of the Agricultural Department, and the areas under such improved varieties are extending rapidly each year.

Special attention has been given to botanical work on oil-seed and pulse crops and improved varieties of the main kharif and rabi oilseeds are now available. This work is financed by grants from The Sir Sassoon David Trust Fund.

Scientific work on the improvement of the bajri crop in Sind has been commenced at Sakrand.

Botanical selection and hybridization work at Larkana has resulted in the evolution of pure strains of rice resistant to "rat" disease. The seed of such resistant strains is being distributed in the "rati" affected rice-growing tracts.

Improved short-period rices for introduction in the non-Barrage tracts have been obtained by scientific work on the Lower Sind rices at Tando Mahomed Khan.

The progress of scientific work on crop improvement in Sind and the schemes in vogue for the multiplication and extension of the seed of improved varieties of crops in the districts has recently been reviewed in detail and a five-year programme of future work drawn up.

Central Provinces.—Action taken on this recommendation has been mentioned in the last three reports. Since then more attention is also being paid to the introduction of improved varieties of oil seeds. A scheme for research work on oil seeds has been submitted to the Imperial Council of Agricultural Research and been approved. It is now awaiting allotment of funds. Improved varieties of cotton and soya bean are also being introduced.

Coorg.—(a) Trials with improved strains of paddy obtained from Coimbatore and Poona are being continued;

(b) Robusta coffee seeds obtained from Ceylon are being tried by some of the planters;

(c) Bud grafts of orange varieties and grape fruit varieties are under trial in the Government Orange Experimental Farm at Gonicoppal.

Delhi.—The action mentioned in the report for the year 1931 was continued. Improved seed was distributed to zamindars as below:—

	Mds	Srs.
8 A wheat	1,550	32
9 D "	35	0
6 518 "	55	0
6 591 "	50	0
Grain No. 7	65	10
Barley No. 4	10	0
Mollisoni Cotton	250	0
Borseem	1	0

Madras.—The work mentioned in the previous report (IV Report) was continued. The scheme for the extension of H-1 Cotton in the 'westerns' area was worked partially.

Paddy has of late not been a paying crop in several parts of the Presidency and attempts have been made to grow more remunerative crops and also to increase the outturn of paddy and reduce the cost of its cultivation so as to bring the cost of production to the barest minimum possible. A Special Officer was appointed for making enquiries regarding the present condition of rice production and marketing with a view to improve the economic position of rice production.

The extension of sugarcane cultivation received a great stimulus. The duty on sugar as well as the slump in the rice market were responsible for this. The evolution of some very good types of sugarcane from the sugarcane stations has been very opportune. Almost all the Agricultural stations cultivated several varieties to meet the increasing demand for seed material. A new sugarcane station, for which funds have been sanctioned by the Imperial Council of Agricultural Research, has been opened at Godiyattam in the North Arcot district. With the aid of the funds granted by the Imperial Council of Agricultural Research, research work on potatoes is under way at the Potato station, Nanjanad.

North-West Frontier Province.—A number of wheats from Pusa, Punjab and Australia have been tried. The Punjab wheat C. 518 gives the highest yields, but Pusa wheats are superior as far as freedom from rust is concerned. There is reason to believe that as the wheat harvesting season is a month later than other Provinces, some of the slow maturing wheats grown in Europe might be suitable for the Province. Arrangements have been made to try these wheats this year. English malting barleys have been tried and have yielded products valued at 150 shillings a cwt. in England and equal to the best English malting barleys. These have, however, been the two row barleys and the low yield would not be compensated by the extra premium obtained. However an English winter six-row barley of fair malting quality has shown to give as good a yield as the local.

At present no oil seeds are grown in the North-West Frontier Province and trials have therefore been made with linseed, sunflower, safflower, tona, etc. The results have been encouraging. Conditions in the North-West Frontier Province are undoubtedly different to those obtaining in other parts of India. It would seem that when the Indus is crossed conditions approximating to those in Southern Europe begin to appear. An example which might be cited is that of sunflower. In Southern Europe sunflower yields 1,800 lbs. seeds per acre, but frequent efforts to grow sunflower in India have never yielded more than 700 or 800 lbs. At the Tarnab Agricultural Station yields of 1,400 lbs. have been obtained.

A most useful work in connection with the introduction of new varieties of crops has been in connection with the propagation of Coimbatore canes. The local Poundah on account of its lack of frost resistance, its susceptibility to red rot the insect borer, and its liability to be eaten by jackals has lost favour with agriculturists, who have eagerly taken up Co-290 and other Coimbatore canes.

The Poundah cane cannot be grown in the hills. The introduction of the Coimbatore canes opens up the possibility of growing canes in many of the isolated valleys up to an elevation of 4,000 to 5,000 ft. Experiments are being carried out in Chitral and in the Kurram Valley. If successful there are likely to be considerable economies of importance.

To spread the habit of eating vegetables in the villages, considerable quantities of the seed of Peas and Broad beans and seedlings of Cabbages have been distributed at very cheap rates.

United Provinces.—The proportion of the area under improved sugarcane seed rose from 80 per cent. in 1934 to over 86 per cent. in 1935, but as new and better varieties come in, the older ones require replacement. New strains of paddy were distributed in certain areas.

Four very promising varieties of linseed, combining high yield and good oil content with rust resistance, have been selected for extensive trial under farm and cultivator's conditions. Other oilseeds in process of selection are groundnut, safflower, gingely, rapeseed and mustards.

Legumes are also receiving attention. A large selection of arhar containing many promising types are under preliminary investigation.

Co-operative societies have been extending help in the distribution of better seeds in the province and have been running seed stores at a few places. Action is now being taken to grant subsidies to selected seed merchants on a wide scale.

6. Research and experiments on Rotations and Methods of Tillage (paragraph 10f).

Assam.—Work mentioned in the last report continued. Cultivation of betel vines on the Bor system and Stick system was taken up.

Baluchistan.—Rotations to reclaim Alkali lands are being tried.

Bengal.—The cropping schemes of all the farms under this department are based on 5 years' rotations. Rotation crops are now being followed by cultivators in many villages. Cereals are generally followed by a leguminous crop and jute by transplanted aman wherever possible. Effort is being made by the department to stop the practice of ratooning of sugarcane and to introduce a good system of rotation.

Bihar and Orissa.—Experiments on cultivation of berseem and lucerne as green fodder were continued. It has been found that under Chota Nagpur conditions lucerne is a more valuable fodder crop in that it continues to flourish throughout the hot weather right into the monsoon, whereas berseem, once the hot weather sets in, ceases to field a heavy crop.

Bombay.—Wider planting of sugarcane and wider sowing of cotton in the North-Central Division continues to be tested in local conditions and demonstrated where possible.

With regard to the methods of tillage, most of the cultivators have now followed the Manjri Farm method of growing cane and cotton.

Wider sowing of cotton and jowar in the Surat and Broach districts is now established. These crops which were sown 18" to 24" formerly are sown 30" to 60" apart with the result that good crops are obtained with less cost of cultivation.

Experiments on wider sowing of bajri, wheat and other crops in North Gujarat are in progress on the Government farms as well as on the cultivator's fields.

In the Southern Division, rotational and tillage experiments for sugarcane were continued on the Gokak Canal Farm and with jowar, cotton, groundnut and tobacco on the Dharwar Farm, with useful results. Groundnut and tobacco again proved superior as rotation crops to jowar in the transition tract and this has proved of value as groundnut forms a major crop in lighter soils in this tract. Experiments to find suitable rotations to fit in a second crop after groundnut (in the same year) are on hand and gram and wheat are being tried as the second (rabi season) crops after groundnut against fallow after groundnut, and useful indications have been obtained. In the Gokak Canal tract the system of growing tur as a row crop with kharif maize instead of taking repeated crops of maize after maize, which was once in favour with the farmer, has now become very popular, and experiments now on hand give very favourable indications in the matter of growing tur or cotton as row crops in maize. The farmer is now fast taking to this mixed cropping in preference to his previous system of growing maize after maize, under irrigation.

At the Agricultural College Farm, experiments on the value of a leguminous crop in rotation with a cereal and of ordinary versus good preparatory tillage have been completed.

The rotation of a leguminous crop of "kulthi"—*Dolichos biflorus*—has increased the yield of the cereal crop of bajri—*Pennisetum typhoides*—to the extent of 20 to 25 per cent. in the first two years and of 10 to 12 per cent. in the next two years, the latter not being however statistically significant, but none of these increases is economically profitable.

The results of tillage and manure on the dry crops of kharif jowar and cotton are conflicting in different years.

In Sind work has been continued on the lines mentioned in previous reports, special attention being given to trials of rotations suitable for reclamation of alkali lands and for the maintenance of soil fertility under post-barrage conditions of irrigation and intensive cultivation. The Agricultural Engineering Section of the Agricultural Department has devoted attention to tillage problems connected with the inter-cultivation of drilled crops and a cheap and efficient implement for this work has been designed and is being manufactured at the Government Workshop, Mirpurkhas.

Delhi.—The action mentioned in the report for the year 1931 was continued.

North-West Frontier Province.—Rotation of crops is well understood in this Province and the zamindars have from old times grown shaftal (*Trifolium repens*) generally before sugarcane or as cover crop for the latter. The Department has introduced berseem from Egypt which has turned out to be a better leguminous crop than shaftal.

The rotation which is mainly practised in the North-West Frontier Province is that of maize and wheat following each other every year after year. Experiments are now being made at all farms to compare this rotation with one, whereby maize is rotated with berseem and wheat with a summer fodder crop such as guara. The fodder crops will be fed to milk cattle. Experiments are not yet complete but the figures would seem to show that a net increase of Rs. 50 per acre can be obtained by this system of mixed farming.

United Provinces.—Rotation experiments and tillage trials continue; definite results are expected after a few more years.

7. Mass production of Wooden Parts of Agricultural Implements (paragraph 105).

Bengal.—Wooden parts of agricultural implements are locally made at a minimum cost. Besides, there being no uniform standard of implements mass production of wooden parts is not a practical proposition so far as this province is concerned.

Bombay.—In the North-Central Division, no action is taken as there is no demand for such parts. In the South-Central Division there is also no special demand for these parts and the general requirements are met by the local carpenters. The two factories at Satara and Kirloskarwadi are supplying all the requirements of iron implements to the cultivators of the South-Central Division.

North-West Frontier Province.—The demand for Agricultural implements in this Province does not justify the mass production of wooden parts, but in the case of the limited sale of ploughs, etc., only the iron parts are imported and the necessary wooden parts are made locally.

United Provinces.—The wooden parts of improved ploughs were prepared locally at different centres and distributed to cultivators at very cheap rates.

8 Organisation of the Agricultural Engineering Sections of the Agricultural Departments (paragraph 106).

Bombay.—Although the boring activities of the Agricultural Department are closed, due to retrenchment, permission to hire out the machines has been granted to meet urgent need of the ryots.

An Agricultural Engineering Section of the Agricultural Department in Sind has been organised and steps have been taken to appoint a permanent Agricultural Engineer and an Assistant Agricultural Engineer in the Province.

The detailed scheme for the development of agricultural engineering in Sind has been put into effect. As a result, an up-to-date agricultural engineering workshop has been established at Mirpurkhas where much progress has been made in the design of new and improved agricultural implements. A complete tractor outfit has been purchased and has been working most successfully for the past twelve months in ploughing and cultivating zamindari lands on the contract system in order to furnish the Department with full and reliable data regarding the economics of mechanical cultivation in Sind.

A ginnery has been established in connection with the Agricultural Engineering Workshop at Mirpurkhas for ginning the improved varieties of cotton grown on Government Research Stations and Farms in Sind.

North-West Frontier Province.—Owing to lack of funds no agricultural engineering section exists.

United Provinces.—The re-organization of the Agricultural Engineering section has brought about a closer relationship between agriculture proper and agricultural engineering.

It has not yet been found possible to have two sections—one for machinery, and the other for boring.

The number of tube-wells constructed was 501 while that of borings in masonry well was 3,680, of which 2,757 were successful.

The officer in charge of Agricultural Engineering is an engineer.

9. Research work on agricultural implements and machinery (paragraphs 107-108).

Bengal.—Several new types of ploughs and cultivators were designed, constructed and put on the market after close testing.

Bihar and Orissa.—The 3 roller power cane crushing mill designed by the Agricultural Engineer and approved by the Sugar Technologist to the Imperial Council of Agricultural Research is now being manufactured by Messrs. Arthur Butler and Company, Limited, of Muzaffarpur and is being supplied to the public at a reasonable price.

Bombay.—(a) The design for the "Ditching Harrow" which is now called a "Soil Scooper" has been completed and the machine tried at the Dry-Farming Research Station at Sholapur, with very satisfactory results. Its aim of checking the run off and conserving moisture seems to have been largely accomplished. Further improvements and tests are in progress.

(b) Out of the fans designed for winnowing purposes, the following have been found to be economical and useful:—

(1) Hand power Chain-Gear Fan.

(2) Hand power Rope-Gear Fan.

These have been found to produce enough breeze for winnowing purposes. The chain-gear model is more appreciated than the rope-gear one due to its ease in working and greater wind velocity. Rope-gear is, however, less costly in initial outlay and very simple in construction. Further tests are in progress.

(c) The design for a Bullock Power Wheat Thresher has been completed and it is greatly appreciated by the agriculturists in Gujarat and Khandesh.

(d) The improved seed drill has almost reached a stage of completion as the results obtained from the Southern Division and Khandesh indicate a distinct advantage over the local drill without much additional draught. The models so far prepared and approved for different purposes are as indicated below:—

(1) The all-steel model with automatic drilling attachment suitable for cereals.

(2) The improved wheat-drill for Jalgaon with automatic sowing attachment.

(3) The improved cotton-drill for Karnatak with automatic sowing attachment.

(e) In addition to the above, the following devices have been newly introduced and are under exhaustive tests with a view to finding out their relative value:—

(1) Bullock power groundnut digger mounted on wheels.

(2) Bullock cart fitted with ball bearings.

(3) The Gujarat blade harrow has been further improved and has been sent to Khandesh for trial.

In Sind the Agricultural Engineer has designed an all-steel bullock cart (Rs. 150), two improved winnowing machines (large, Rs. 240, small Rs. 150) and an intercultivator (Rs. 11). All these improved agricultural implements have been fully tested in the districts and are now being manufactured at the Agricultural Engineering Workshop in

order to supply the demands of cultivators. Special attention is now being given to (a) the design of a light double-engined cable set for cultivation in small fields, (b) a wheat harvesting and threshing machine and (c) cheap and economical water-lift for low lifts, i.e., 2-4'. An improved clod-crusher is being manufactured by a certain firm in Karachi for Rs. 70 and several hundreds of these implements have been sold to cultivators.

Madras.—The design and improvement of implements received considerable attention. New improvements in seed distributor and clutch mechanism were made to the mechanical seed drill which greatly enhanced its utility. Several new drills are under trial in the districts.

A light ridge plough for use with an average pair of animals has been designed and can be used for chillies or cotton. A number of improvements were made in Cooper's Hindustan Persian Wheel. Other items of research include the designing of steel-framed cart bodies to suit pneumatic tyres and large bund-forming implements for use in the dry-farming areas. Centrifugal machines for the manufacture of white sugar were tested and experimented upon. Experiments are in progress to evolve a suitable machine for polishing turmeric.

North-West Frontier Province.—Owing to the absence of an Agricultural Engineering Section it has not been possible to do much work on this subject, but considerable trials have been made with implements from other provinces and countries. For example, the Egyptian Norag for threshing corn and Egyptian Low Lift Pump have been imported and have proved successful. A thresher recommended by Pusa has also been tried. A bullock hitch has been evolved whereby several junior Planet Hoes can be operated by one pair of bullocks. This has shown considerable economy in weeding.

United Provinces.—The experiments which were conducted for testing the merits of the country and inversion plough showed that even shallow ploughing with inversion gives a better outturn of wheat and gram than deep ploughing without inversion. Deep ploughing with inversion resulted in a slight increase of outturn, but this increase is not sufficient to justify the extra labour on the part of cattle.

Further tests under commercial conditions were carried out on the two three-roller sugarcane crushers which were made in accordance with the designs supplied by the Sugar Technologist to the Imperial Council of Agricultural Research, but the results are not yet available.

Special attention is now being paid to the designing of seed drills, intercultural implements, etc.

10. *Attention to problems of Cultivation in Dry and Precarious tracts (paragraph 112).*

Assam.—There was expansion of terrace cultivation of rice in the Naga and North Cachar Hills. A number of new terraces were opened. Successful demonstrations were carried out with several varieties of rice. Fruits and vegetables also are being grown on terraced land.

Bihaar and Orissa.—Further work on dry farming carried out at the Gaya Farm has confirmed the previous findings that, with judicious manuring and cultivation, it is possible to get about 400 to 500 maunds of stripped sugarcane and 6 to 8 maunds of wheat per acre without irrigation.

Bombay.—During the year 1934, the use of seed grading by means of sieves, sowing with the improved seed drills in plots with low bunds to check surface erosion, and constant interculturings was advocated on a large scale and the area under these two methods of dry-farming has been increased to 2,500 acres in the Poona District and about 1,500 acres in the Ahmednagar District. 55 villages have adopted this method. During the year 1935, the area in the Poona District was increased to 3,000 acres and 2,000 acres in the Ahmednagar District. There are in all 169 sets of dry-farming tools distributed in 84 villages of the Ahmednagar District. On account of the abnormal fall of rain during these two years marked results of dry farming were less noticeable.

The scheme for research in dry-farming for the Deccan, sanctioned by the Imperial Council of Agricultural Research, commenced its work on 1st October 1933 at Sholapur and Bijapur. The first season from October 1933 to June 1934 was utilised in carrying on uniformity tests on the fields selected for the conduct of the work and in constructing laboratories and essential farm buildings. The equipment of the laboratories and of the farms was also carried out during that period.

Regular experimental work on dry-farming was carried on during the agricultural season of 1934-35 at both the centres, viz., Sholapur and Bijapur. The first detailed report of the work has been submitted to the Imperial Council of Agricultural Research. The report comprises the work in three different lines, viz., soil plant and the field. The prevailing soil types at both the centres have undergone thorough examination for their physical and chemical behaviour and the methods of ameliorating them will be tried in due course.

The jowar or sorghum plant is being studied intensively from germination to maturity. Accurate determinations of the water requirements of the plant have been made during the years under report. The moisture condition of the soil at which the plant wilts is being determined.

In the field, the value of different methods of stopping run-off of rain water, the utility of interculturing, the importance of thorough preparatory tillage and the necessity of having an optimum plant population are being investigated. The economics of the method of dry-farming are also being studied simultaneously.

In Sind no action is required, except possibly in the Desert Division of Thar Parkar District. Botanical work to obtain a drought-resistant type of bajri, suitable for extension in this tract, is in progress.

Delhi.—The action mentioned in the report for the year 1931 was continued.

Madras.—The scheme for the study of dry-farming problems in Bellary district, sanctioned by the Imperial Council of Agricultural Research, has been started and is in progress.

Punjab.—The action taken on this recommendation has been mentioned in the reports sent in 1929, 1930 and 1931. A Dry Farming Station jointly financed by the Imperial Council of Agricultural Research and the Punjab Government has since been started in the South-East of the Province.

North-West Frontier Province.—At the new farm at Naurang Serai 100 acres of barani land has been taken up and extensive experiments of dry farming have been carried out. In the same way at Tarnab some 30 acres of barani land have been rented for the same purpose.

United Provinces.—Action is being taken in dry and precarious tracts where there is little water in the soil, and the soil is unsuitable in texture for agricultural purposes to effect soil improvement by the addition of manure and plant leaves and bandhi making; the cultivation of such plants is encouraged as can draw water from a greater depth and conserve the moisture.

11. *Legislation to deal with Pests and Diseases (paragraphs 113 and 114).*

Burma.—A Bill called the Agricultural Pests' Bill, has been prepared by the Director of Agriculture, Burma. It will be considered by the Local Government and presented in due course to the newly formed legislature of Burma after the separation.

Madras.—The Cotton Control Act prohibiting the cultivation and mixing of Pulichai (*G. neglectum*) cotton and its sale was enforced.

North-West Frontier Province.—Such legislation is undoubtedly necessary for this Province, but so far it has not been possible to introduce it.

United Provinces.—No legislation has yet been enacted, but the question of introducing legislation for the control of the Pink Boll worm is being considered.

12. *Protection against wild animals and vermin (paragraph 116).*

Assam.—Raticide and Carbon Bisulphide were used on Government Farms for controlling rats.

Bombay.—In the North-Central Division, there are three crop-protection societies in Khandesh. Half a dozen more have been organised and are being sent up for registration. A campaign for digging ant-hills and killing queen ants was undertaken in one village in Khandesh with good results. The use of insecticides to control aphids and thrips on different crops is advocated and increasingly adopted.

The total number of wild animals killed was 557 during the year 1935-36, of which 487 were pigs, 43 deer, 12 jackals and 15 wild cattle, in 6 districts, *viz.*, Poona, Satara, Ahmednagar, Dharwar, Kanara and Belgaum.

Scope of work—Four more organisations are proposed in the Southern Division by Rural Uplift Committees and preliminary arrangements have been made. The Commissioner, Southern Division, has sanctioned an amount of Rs. 108 for rewards for Gun Clubs in the Dharwar District. The Collector of Kanara has sanctioned Rs. 200 for the work of crop protection by Gun Clubs in the Kanara District. Similarly, five crop-protection clubs are being organised in the Poona District in collaboration with the Deccan Agricultural Association. Three more Gun Clubs are being organised in the Satara and East Khandesh districts.

Fencing compact areas against the wild pig in the Mallad tract is not progressing as rapidly as one would expect. This is due to certain handicaps which have not yet been removed. The Gun Club at Arwatgi mentioned in the last report did very good work during 1934 and 1935. More Gun Clubs were started during these two years in the western parts of the Dharwar and Belgaum districts and they also did good work. In all 375 wild pigs were killed and many more were scared away with a result that the cultivators of 52 villages saved their paddy crop without much watch-work at night time. The demand for similar clubs is fast increasing and it is receiving attention. The extirpation of the prickly pear by the cochineal insect has resulted in destroying the usual shelter for wild pig in the Mundargi Petha and elsewhere in the eastern tract. This kind of work is very much appreciated by everybody.

Central Provinces.—Action taken on this recommendation has been mentioned in the reports for 1929 and 1934. Mr. Dumble's scheme for the study of habits of wild pig, deer, etc., was put up before the Provincial Board of Agriculture. The Board did not support the scheme as it was only of local interest and the Board emphasized the necessity of continuing the awards for the extermination of pig.

Coorg.—Spraying Bordeaux mixture to combat the leaf disease of coffee is becoming a regular item of work in the coffee estates. The Agricultural Demonstrator gives necessary instructions for combating insect and fungus pests of crops. Pests on orange and coffee are receiving particular attention.

Delhi.—The action mentioned in the report for the year 1931 was continued.

United Provinces.—It has been found by experiment that a fencing of 1" mesh, 18 G wire netting, 4' wide and 1½' buried below ground is effective in excluding porcupines from forest plantations.

In addition to a fumigation force pump which was successfully employed to combat the rat menace, cheap methods of fencing with barbed wire, digging trenches and raising up walls at cheap cost are being introduced.

North-West Frontier Province.—This is not a serious problem in the North-West Frontier Province, except in regard to rats and mice against which cynogas is being extensively used.

CHAPTER V.—Subdivision and fragmentation of holdings.

13. Action to deal with the problems presented by the Sub-division and fragmentation of holdings (paragraphs 124—127).

Central Provinces.—

Year.	Area consolidated (acres).	Khasra numbers before consolidation.	Khasra numbers after consolidation.	Cost.	Cost per acre.
				Rs. a. p.	Rs. a. p.
1934	118,154	184,912	52,064	20,738 0 0	0 3 7
1935	175,950	356,800	81,224	41,798 0 0	0 3 10

Delhi.—Two more posts of Sub-Inspectors for consolidation of holdings were sanctioned, and it is hoped that the incumbents will take over their duties shortly.

At the close of the Co-operative year, viz., 31st July 1935, consolidation had been carried out in ten villages and in an area comprising about 8,035 acres. Work is going on in three more villages and it is hoped that by the end of July 1936 work in them will be completed. Work will naturally be greatly expedited by the appointment of the two new Sub-Inspectors.

North-West Frontier Province.—The number of Consolidation of Holdings Societies in the Province is now 16. Total area repartitioned is 9,948 acres. The Co-operative Department has achieved notable success in the consolidation of holdings in the Swabi Sub-Division. Undoubtedly there is a considerable scope for further work. The introduction of legislation to make consolidation compulsory if a certain proportion of those concerned desire it, is very necessary.

Punjab.—The consolidation of holdings by co-operative societies, begun in 1921, is becoming increasingly popular, and in 1934-35, 63,534 acres were consolidated at a cost of Rs. 1-12-0 per acre, a material part of which was defrayed by the people themselves. In some districts as much as 8 annas an acre has been contributed in this way, and it is being increasingly recognized that consolidation is essential to any real agricultural progress. For this reason over Rs. 2 lakhs have been set aside to extend it out of the Government of India subvention for measures of rural benefit. Government proposes further to attempt consolidation through a special revenue staff backed by a special Act now under consideration.

United Provinces.—The number of villages in which holdings were consolidated through co-operative societies rose from 28 to 68 during the last two years.

A scheme for the remodelling of holdings by straightening the boundary lines of fields was successfully initiated at some centres associated with tube-wells.

CHAPTER VI.—Demonstration and Propaganda.

14. Review of methods of propaganda employed (paragraph 130).

Assam.—Demonstration and propaganda continued as before. Lantern lectures were delivered by Agricultural Inspectors. Vegetable gardening in Lower Primary and Middle English Schools has expanded. A number of middle class farmers appointed by the department as honorary correspondents in different parts of the province rendered substantial help in carrying out demonstrations and propaganda. Advantage was taken also of public functions for the purpose of propaganda work. Some district and rural agricultural associations have also been organized.

Baluchistan.—There is no staff for propaganda work. Tours are, however, arranged in various parts of the Province and demonstrations of pruning and spraying within the very limited scope of the budget are given.

Bengal.—Adequate funds were lacking for intensive propaganda so necessary to bring the recommendations of this department to the direct notice of the agriculturists. Magic lantern lectures in the *hats* and exhibitions, distribution of leaflets and bulletins, talks on agriculture through the Calcutta Broadcasting Station, were, however, continued as usual. The department had also to participate very actively in the jute restriction propaganda organised by the Collectors of the districts as well as in the village propaganda work by means of Cinema shows organised by the Publicity Department.

Bihar and Orissa.—The system of bringing the recommendations of the department to the notice of the cultivators by intensive demonstrations on their own fields is meeting with continued success. As a result of a grant from the Government of India it has been possible to entertain, only recently, a special staff for carrying out intensive propaganda amongst the sugarcane growers for the improvement of sugarcane cultivation in the areas from which the sugar factories draw their supply of cane.

Bombay.—The following methods were employed:—

1. Ocular demonstrations on cultivators' fields.
2. Demonstrations and Shows.
3. Distribution of leaflets.
4. Jamabandi meetings.
5. Conferences and classes.
6. Lectures, including magic lantern demonstrations.
7. Reading agricultural literature in villages during halts.
8. Contributing articles to the Press.
9. Help to Taluka Development Associations, Village Improvement Committees and enterprising agriculturists.
10. Use of posters.

Village improvement societies were organised in the Kaira District at two villages for introducing improved methods of agricultural and social reforms. As a result these villages have taken up premium buffalo-bulls, and sulphur dusting against mildew in 'jiru' crop has been introduced.

An intensive propaganda against cotton boll-worm was organised in the Surat and Broach districts from the grants given by the Indian Central Cotton Committee, by giving magic lantern lectures and holding meetings in groups of villages. As a result, nearly 7,000 plant-pullers were sold to the cultivators.

The district staff of the Agricultural Department arranged demonstration plots on cultivators' fields for showing improved varieties of crops, effects of manures, wider sowing, gul-making, sulphur dusting against mango grass-hoppers, use of sulphur dust against smut in jowar, etc., at several places in all the districts.

Horticultural classes were organised at several places in the Kaira District where methods of grafting, pruning, etc., were actually shown to the people interested in fruit culture.

In Sind the scheme for the development and extension of agricultural propaganda and demonstration work has largely been put into effect. The district charges for demonstration work have been reorganized and additional staff appointed and put into training under experienced officers. A five-year programme for agricultural demonstration and propaganda work in the districts has been drawn up as a result of a staff conference of all officers of the Agricultural Department engaged in this work.

Central Provinces.—Action taken on this recommendation has been mentioned in the report for the year ending the 31st December 1920. Refresher courses are being held periodically.

Coorg.—Experiments with chemical fertilisers proved successful, and, as a result of extensive propaganda to advocate their use indents for 8 tons have been received from different quarters and steps taken to supply it. The advantages of ploughing with iron ploughs were demonstrated at ten centres and such ploughs are becoming popular. Spraying of coffee is becoming a regular item of work in the coffee estates and the Agricultural Demonstrator, on the request of several owners demonstrated the process in all its details and coached the labour entrusted with that work. Advice was freely given on cultivation

of crops and also on tackling crop pests. Occasion was taken by the Agricultural Demonstrator of the several general meetings of the village co-operative societies, conferences, and the cattle fairs, to lecture and impart instructions on improved methods in cultivation. The cultivators are slowly but surely realising the importance of cultivation on scientific lines.

Delhi.—The methods of propaganda mentioned in the report for the year 1931 were continued.

Madras.—Attention is invited to the remarks in the report for 1930.

During the two years to which the report relates, the staff of this department made keen endeavours to teach illiterate ryots the methods of preventing infectious and contagious diseases among cattle, and instructive advice was given on the advantages of preventive inoculation of cattle for the various contagious and infectious diseases. The advantages of the present method of goat virus vaccinations against rinderpest were brought home and advice regarding feeding of cattle and proper breeding was also given. Cattle fairs, shows, festivals, village schools, etc., were visited and exhibits of veterinary interest shown in booths constructed in cattle fairs and shows. Propaganda work was also carried out by participating in the Health and Baby Week celebrations. The motor exhibition vans of the Agricultural Department were used with advantage by the staff of this department. Demonstration of castrations by the Burdizzo method was also done.

Towards the close of the year 1934-35, Government issued orders transferring to this department for propaganda purposes the motor lorry attached to the office of the Director of Public Health, Madras. With the aid of this lorry, which has been converted into an exhibition van, it is hoped that the department will be able to carry on propaganda work on a more intensive scale and familiarize the ryots with veterinary matters in a much shorter period than would otherwise be possible. By its means the remote districts were reached. As in previous years, propaganda work was continued by the staff during the course of their tours by way of free distribution of departmental leaflets to the ryots, by delivering lectures with the aid of magic lantern slides on important contagious diseases of cattle and also on diseases communicable to human beings.

North-West Frontier Province.—Since the submission of the last report the staff of the Agricultural Department has been increased by three Agricultural Assistants who are mainly employed in carrying out propaganda work in the districts.

United Provinces.—Agricultural propaganda continues vigorously and was extended to the remoter villages by means of demonstration carts with exhibits, implements and slides. Kiosks were erected and boards and posters giving useful information displayed at railway stations and other suitable places. Publicity vans fitted with exhibits toured throughout the province. The number of private farms increased from 1,847 in 1934 to 1,367 in 1935. Demonstrations of new varieties of crops and of better methods of tillage and manuring are carried out on the cultivators' own plots. It is not feasible at present to compare the relative cost of the different methods with the results achieved.

15. *Re-examination of the policy of establishing Demonstration Farms in the Punjab and the U. P. (paragraph 131).*

No remarks have been received from the local Governments concerned.

16. *Establishment of Special Demonstration Farms (paragraph 131).*

Baluchistan.—There are no special demonstration farms.

There is one Seed and Experiment Farm which is also used for demonstration purposes. It is at Usta Muhammad in the Nasirabad Colony in the Sibi District.

Bombay.—In Sind, the six Government Auxiliary Demonstration Farms, established under the "Six Farm Scheme" are in full working order and are proving most valuable in extending the propaganda work of the Department. "Farmers' Weeks" are held twice annually at each of these demonstration farms.

Coorg.—The advantages of using fertilizers and good seed strains are being demonstrated on ryots' own fields at half a dozen important centres. An experimental farm, opened in 1934, at Gonicoppal, to determine the cultural and manurial needs of orange, growing budded plants and growing orange varieties, is continuing its work.

Propaganda on improved methods in agriculture on occasions of conferences of local co-operative unions, general body meetings of the village co-operative societies and cattle fairs by lectures and exhibitions of manures and the results of the use of such manures was carried on with good results.

Madras.—Attention is invited to the remarks in the report for 1930. The concentration method of demonstration in a few selected centres has been modified. With a view to increase the number of demonstrations and demonstration plots, and at the same time to concentrate work in a definite number of villages, each demonstrator was allowed to extend his activities over eight to ten demonstration centres within his jurisdiction, which has resulted in a large increase in the number of demonstrations, and demonstration plots.

North-West Frontier Province.—A new farm has been started at Naurang Serai in the Bannu District and proposals are under consideration for starting farms at Vernacular Middle Schools to be financed from the Rural Reconstruction grant.

United Provinces.—A number of seed and demonstration farms are working successfully in so far as the demonstration of improved seed, implements and methods of cultivation are concerned.

With a view to demonstrating to small zamindars the crops that should be sown and the methods of tillage that should be employed under the changed conditions arising out of canal irrigation, four small model farms have been opened in the Saida Canal area and are running satisfactorily.

17 Establishment of Short Courses on Demonstration and Seed Farms (paragraph 135).

Assam.—Two training classes at Jorhat and Silhet farms have been started with 10 students in each station on a monthly allowance of Rs 6 for each student. Practical as well as a certain amount of theoretical training in agriculture is being given in these classes. The course extends over 18 months. Efforts will be made to settle the students in agricultural colonies.

Bihar and Orissa.—The value of the facilities for practical training in scientific agriculture in the Central Farms of this province is being increasingly appreciated and more and more people are taking advantage of these facilities every year.

Bombay.—In the North-Central Division, seven short-course classes on agri-horticultural subjects and poultry keeping were held with very good response from cultivators.

In the South-Central Division during the year 1931, 231 demonstrations and 12 big agricultural shows were held, while during 1935, 222 demonstrations, 51 jamabandi meetings, 64 magic lantern lectures and 14 big shows were arranged. During the year 1934, 18 agricultural classes were arranged, while during the year 1935, 20 agricultural classes were arranged. The sugar-making classes held at Hol and Manjri were the special features of these years.

In the Southern Division two training classes in horticulture were conducted on the Arbharai Farm and 102 cultivators attended them. Many fruit gardens are coming into existence as a result of these classes. Short courses were arranged on the Dhawar Farm for training men in practical poultry-farming. A few have already started breeding White Leghorn and Red Rhode Island birds.

Short courses in dairying were given at the Poona Agricultural College to ten persons during the last three years.

In Sind, short courses in annuaries valuation and in improved methods of agriculture, for officers of the Revenue and Irrigation Departments, are being continued twice annually at the Agricultural Research Station, Sakrand. Arrangements are being made for short courses in horticulture at the Government Fruit Farm, Mirpurkhas, and in tractor driving and maintenance at the Government Workshop, Mirpurkhas. Practical training in improved agriculture has been provided for on Auxiliary Demonstration Farms in the districts for zamindars' relatives and nominees who cultivate separate holdings on these farms under the supervision and direction of the Farm Managers.

Central Provinces.—Action taken on this recommendation has been mentioned in the report for the year ending the 31st December 1930. The combined course of instruction for Irrigation and Agricultural Officers was again held in 1935.

North-West Frontier Province.—A class for 10 educated young men at Tarnab has been started and the necessary accommodation has been supplied. In addition, zamindars have been sending labourers to Tarnab for training in budding, grafting, pruning etc.

United Provinces.—Co-operative supervisors, sons of interested zamindars and district board rural teachers were given training at some of the departmental farms. Short courses were also held to train selected villagers who worked as village guides on completion of their training.

18. Comparison of the two systems of carrying-out Demonstrations on the Cultivators' own fields (paragraph 136).

Bihar and Orissa.—There can be no doubt about the superiority of the system of carrying out demonstrations on the cultivators' own fields. But it is obvious that in order to produce the full effect, a large field staff is necessary which the Agricultural Department does not possess at present.

Bombay.—In the Presidency proper demonstrations on cultivators' own fields appeal to the cultivators more than those on Government farms and this method is followed as far as possible. In Sind also, the policy of carrying out the main demonstration work of the Agricultural Department on the lands of cultivators is being continued and extended.

Delhi.—The action mentioned in the report for the year 1931 was continued. 117 comparative demonstration plots were made on land owned by zamindars during the period under review.

North-West Frontier Province.—Demonstration plots are arranged in the heart of villages, and new varieties of crops are tried along with the local ones in the fields of the cultivators by the staff appointed on district duty.

United Provinces.—Both the systems of demonstration have proved effective.

19. *Peripatetic Demonstrations of the use of Improved Implements (paragraph 138).*

Baluchistan.—Improved implements are being used at the Fruit Experiment Station, Quetta, and the Seed Experiment Farm at Usta. Demonstrations of spraying machines only are given as people are mainly interested in fruit culture.

Bihar and Orissa.—Two more new centres for peripatetic demonstrations of improved implements were added in South Bihar, each with several sets of improved implements for demonstration work.

There is provision for such peripatetic demonstration outfits in the sugarcane improvements scheme and it is hoped, that under this scheme, full use will be made of this type of demonstrations.

Bombay.—A large number of demonstrations of ploughing with iron ploughs were held with the result that iron ploughs are becoming increasingly numerous.

In the Ahmednagar District, the Shevgaon Pathardi and Jamkhed societies have kept more than 1,000 ploughs for hire and the total hire collected by these societies is nearly Rs. 4,500 during the last year.

In Sind, work is being continued on the lines mentioned in previous reports.

Delhi.—The action mentioned in the report for the year 1931 was continued. About 325 demonstrations of improved implements and exhibitions of selected seeds were made during the period under review. Zamindars purchased a number of improved implements.

North-West Frontier Province.—In the absence of any special staff for this purpose Agricultural Assistants on District duties have been instructed to carry out the work as far as possible by giving demonstration of the use of implements on zamindars' own lands. This has had good results and many progressive zamindars are now using the improved implements.

Peripatetic bullock-carts have been extensively touring in the interior of the province to demonstrate the use of improved implements and seeds. Arrangements have been made in some places for the hiring of sugarcane crushers.

20. *Agricultural Shows and Agricultural Stalls (paragraph 139).*

Assam.—The department participated in a number of shows and exhibitions in both the valleys.

Bihar and Orissa.—The activities of the Agricultural Department as stated in the Report for 1932 and 1933 have been maintained.

Bombay.—In the North-Central Division one mango show, two cattle shows and five agricultural and cattle shows were held during the period. Stalls were also arranged exhibiting agricultural implements at some religious fairs.

District shows at Chikodi, Kanbagi and at Bijapur were held mainly through the local Taluka Development Associations. Numerous village demonstrations of improved crops and implements and of methods of control of plant pests and diseases were held by the district staff of the Agricultural Department in their jurisdiction with good results.

In Sind, numerous local agricultural shows and large demonstrations of improved methods and materials of agriculture are held annually in all districts. Such shows are generally organised in connection with local fairs or large gatherings of cultivators.

Delhi.—See remarks against item No. 19.

Madras.—Action is being taken on the same lines as mentioned in the report for 1932 and 1933.

North-West Frontier Province.—Agricultural Shows, combined with Horse and Cattle Shows, are held at all districts in the Province every year.

United Provinces.—The display of departmental exhibits at district fairs and shows has been helpful in arousing general interest among the agricultural classes. No permanent agriculture stalls have yet been established as there are no regulated markets, but kiosks were put up at a number of railway stations and other suitable places.

Prizes and medals are given by the exhibition authorities in consultation with the local agricultural officers. Sometimes the prizes are in cash, and sometimes in the shape of improved ploughs or other agricultural implements, according to local preference.

21. *Other Forms of Propaganda (paragraph 141).*

Assam.—The following leaflets and bulletins were published by the department during the period under report:—

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| 1. The Breeding Bull—Its care and use in Assam | Bulletin No. 1. |
| 2. Worms in cattle—the importance of the subject to Assam, general information and treatment. | Bulletin No. 2. |
| 3. The Making and use of Silage in Assam | Bulletin No. 3 (New series). |
| 4. Bee-keeping | Bulletin No. 4. |
| 5. Dairying and Dairy Farming | Bulletin No. 5. |
| 6. Cultivation of substitute crops for Jute | Bulletin No. 6 (in Bengali and Assamese). |
| 7. Silage of Uridal or Jhota Ghas (wild Deep Water paddy) | Bulletin No. 7. |
| 8. Hints on the improvement of cultivated crops | Bulletin No. 8 of 1935. |

Special attention is being paid to vegetable gardening in rural schools.

Baluchistan.—A small Entomological and Mycological Research Laboratory has recently been opened and insect pest and fungoid diseases are being studied.

Bihar and Orissa.—The illustrated quarterly journal 'Kisan', published under the auspices of the Bihar and Orissa Provincial Agricultural Association, continued to disseminate knowledge of scientific agriculture among cultivators and lay-men in general.

From the grants given by the aforesaid Association, two magic lantern outfits, with a number of suitable slides, have been purchased and are being extensively used for propaganda, specially in exhibitions and *melas*.

Bombay.—Lectures on useful agricultural subjects at the Janabandi meetings and in training classes for village patils and various shows and demonstrations were continued. Special instructive leaflets were issued after the severe frost in the North-Central Division by the Agricultural Department. The Village Improvement Associations, Khandesh and Nasik, were also induced to print some leaflets on useful subjects for distribution.

In Sind, 53 Agricultural leaflets, dealing with different items of agricultural improvement, have been prepared, printed in Sindhi and English, and widely distributed in the districts. The Publicity Officer of the Indian Central Cotton Committee is working in close co-operation with the Department, in propaganda work by means of posters, leaflets, etc., to extend the cultivation of improved varieties of cotton in the Barage areas. A touring propaganda party, with magic lantern and slides illustrating agricultural improvements, tours each cold weather season from village to village in the districts.

North-West Frontier Province.—With the installation of Peshawar Broadcasting Station in March 1935 extensive propaganda on Agricultural subjects has been carried out. There is a short talk every day on agriculture and animal husbandry. Suitable slogans are turned into rhymes and sung to popular and catchy tunes between each item of the programme. Copies of the Agricultural talks in Pushto and Urdu are being distributed.

United Provinces.—Demonstration carts with exhibits, implements and slides of agricultural interest toured the remoter villages. Owing to lack of funds, propaganda could not be carried on through cinemas, wireless and demonstration trains.

22 Formation of Divisional Boards and Taluka Development Associations (paragraph 145)

Assam.—Several district and rural agricultural associations were organised.

Bihar and Orissa.—The Bihar and Orissa Provincial Agricultural Association is doing useful work in bringing the Agricultural Department into closer contact with the non official public who take active interest in agricultural matters. The departmental officers continued to give every possible assistance in the working of the Divisional Development Boards.

Bombay.—In the North-Central Division, the Taluka Development Associations are doing good work and some have started cattle farms. Attempts are being made to start a couple of more Taluka Development Associations where none existed before.

During the year 1934, the total number of Taluka Development Associations in the South-Central Division was 22 and 3 new Associations have been organised. During the year 1935, special attempt has been made to organise 20 new Associations which will be shortly registered. Thus, the total number of Taluka Development Associations in the South-Central Division may come to 42. All the Associations are working under the control of the Deccan Divisional Board of Agriculture.

In Gujarat, there are 6 Taluka Development Associations, of which 5 are actively working. No new Taluka Development Associations are formed as it is not possible to give them grants due to financial stringency.

A new association, named the Southern Gujarat Fruit and Vegetable Growers' Association, was formed with its headquarters at Pardi. It was registered under the Co-operative Societies Act. It is doing useful work in arranging the despatch of produce at a cheaper rate by procuring facilities from the railways by booking fruit and vegetables in wagon loads.

In the Southern Division, there are 15 Taluka Development Associations and excepting a few they did good work.

The Taluka Development Association organisation is not suited for Sind conditions and steps are being taken to organise co-operative associations of cultivators with common interests and in smaller units.

Madras.—Three new Agricultural Associations were formed in the Guntur circle for the improvement of agriculture. The Trichinopoly District Agricultural Association publishes marketing intelligence for agricultural products. The Tanjore District Mirasidars' Association, newly started at Mayavaram, conducted an Agricultural Show at Aduturai. The District Advancement Association, South Kanara, organized a flower and vegetable show at Mangalore. The fruit shop maintained by it continued to market fruits and vegetables produced in the district. The Agricultural Association, Palghat, maintains a breeding bull under the premium scheme and lends a few iron ploughs to cultivators.

Punjab.—The action taken on this recommendation was mentioned in the report sent in 1930. Since then, talhsil Agricultural Associations have been formed, as a tentative measure, in the districts of Jullundur, Hoshiarpur and Ludhiana.

United Provinces.—There has been an increase in the number of co-operative better farming societies.

23. *Use made of Co-operative Societies in Demonstration work (paragraph 147).*

Bihar and Orissa.—The Agricultural Department has continued to work in close co-operation with Central Co-operative Banks and Co-operative Societies, but on account of the prevailing financial depression, Co-operative Banks and Societies have not been able to take full advantage of the facilities offered by the Agricultural Department.

Village Welfare Societies have been organised in Ranchi and Palamau districts. The Palamau Association is strongly organised and consists of 15 thana committees and 46 gram sabhas. It maintains inspectors for propaganda purposes and has a journal of its own called 'Kisan-Mitra' (Cultivators' friend), which is distributed free.

Bombay.—In Sind, the Sind Central Co-operative Bank, Limited, is co-operating with the Agricultural Department in seed multiplication and extension work.

Central Provinces.—Agricultural Assistants and Veterinary Assistants continued to attend rallies and conferences of co-operative societies and to explain the use of improved methods of agriculture and the proper care of cattle. On account of poor crops and low prices, agriculturists are reluctant to try new methods. No better farming society could therefore be formed.

Madras.—Besides the item of work mentioned in the previous report, work was started with the help of the Co-operative Department and Central Banks at Cuddalore and Tiruvannamalai. The scheme for marketing of groundnut in the North-South Arcot district is in progress. A special staff from both the Agricultural and Co-operative Departments was at work in educating ryots on the aims and objects of the scheme and the advantages thereof. One Co-operative Agricultural Society opened a marketing section, maintained godowns and issued loans to ryots on the security of their produce. Co-operative and Loans Societies were started for the benefit of pepper growers.

There were ten agricultural demonstration societies on 30th June 1934 and eight societies on 30th June 1935. The membership was 344 and 337 respectively. During 1933-34, four societies in Trichinopoly district transacted some business. They introduced improved methods of cultivation in paddy and cotton on 58 acres of land. The Lalgudi Sivagnanam Agricultural Demonstration Society took on lease 40 acres of wet land for demonstration purposes. It made a net profit of Rs. 595.

During 1934-35, the only society that did some useful work was the Lalgudi Agricultural Demonstration Society. It cultivated 17 acres of land for the first and second kharif (paddy) crops by improved methods and made a profit of Rs. 127.

North-West Frontier Province.—Seed in small quantity has been distributed through the Agency of the Co-operative Department of the Peshawar District.

United Provinces.—Extensive demonstration and propaganda work was conducted by the Agricultural Department in association with co-operative societies, and the assistance of a large number of such societies was secured in the distribution of pure seeds. Better farming co-operative societies working in some areas received the special attention of the Agricultural Department.

24. *Appointment of a Special Officer for the organisation and systematization of Propaganda work (paragraph 148).*

Bihar and Orissa.—Two temporary Assistant Directors of Agriculture for North Bihar and one for South Bihar have recently been appointed under the Sugarcane Improvement Scheme for the sole purpose of organising and systematizing propaganda work for the improvement of sugarcane cultivation.

Bombay.—No such officer has been appointed in this Presidency.

Burma.—It has not been possible to give the question of a Special Propaganda Officer any further consideration.

Central Provinces.—No such officer has yet been appointed.

North-West Frontier Province.—Co-operative funds have not allowed any action to be taken.

United Provinces.—An Assistant Director of Agriculture attached to headquarters continued to look after the organization of propaganda work, under the personal supervision of the Director of Agriculture.

CHAPTER VII.—Animal Husbandry.

25. *Work on Sheep and Goat Breeding (paragraphs 158—159).*

Assam.—The flock of Bikanir sheep (now numbering 37) at Upper Shillong mentioned in the last report remained under observation. Health was good and breeding regular. No deterioration in size is noticeable. Yield of wool is 5 lbs. in rams and 3 lbs. in ewes per annum. The average rainfall is 97 inches.

Observation on a small number of goats, Jamunapuri, local and crosses, have not yet given any indication of a hopeful line of work.

Bombay.—The proposed sheep-breeding farm, mentioned in the last report, has not been started as yet, as funds have not been allotted by the Imperial Council of Agricultural Research.

No work on goats has yet been done. A scheme for goat-breeding has been accepted by the Imperial Council of Agricultural Research.

Delhi.—Little has been possible in this direction. A sum of Rs. 500 is available for the purchase of he-goats for breeding. Efforts are being made to procure males of a good strain.

Punjab.—Under the departmental scheme, a further supply of 175 three quarter merino rams and 29 ewes was made at concession rates to selected breeders in the hilly district of Kangra from the Government Cattle Farm, Hissar, as against 202 merino rams and 23 ewes in the previous two years. The local Government have decided to transfer Rakh Dand in the Salt Range (Tahsil Pind Dadan Khan, Jhelum district) measuring 689 acres, from the control of the Forest Department to that of the Veterinary Department for 5 years in the first instance, for the purpose of starting a Co-operative Sheep Breeding Society under the supervision of the Veterinary Department.

From the flock of Bikaner desert sheep maintained at the Government Cattle Farm, Hissar, 211 rams were issued at concession rates to certain selected districts in the Punjab to improve the local indigenous breed, as against 93 rams in the previous two years.

Very satisfactory progress has been made in this work at the Government Cattle Farm, Hissar. By grading and selective breeding, the Farm has been able to raise the over-all-average milk yield from 12 ounces in 1932-33 to 1 lb. 8 ounces in 1934-35. Seventy-three male goats were issued to breeders during this period as against 84 during the previous two years to improve the milk yield and the size of the local goats. The Veterinary Department is making every effort for the castration of undesirable male stock, wherever pedigree stock are distributed.

North-West Frontier Province.—Useful results have been achieved in the Kaghan Valley by the introduction of the Merino-Bikaneri cross (Hissar Dale). Crossing with the pure Merino in certain parts of Manesha tehsil is full of possibilities and the Civil Veterinary Department is in correspondence with Australia and the Union of South Africa for the introduction of pure Merino blood.

Possibilities of improving the local sheep industry in certain parts of the Province by crossing with the Ghilzai strain have been examined and some practical shape will be given to these observations as funds permit.

Various breeds of local goats have been surveyed from a scientific view point and a scheme is now on foot to introduce in parts of Kohat, Bannu and Dera Ismail Khan districts, Jamna Pari strain of goats which are well-known for their milk yield.

United Provinces—Research on goat breeding was continued at the Mission Poultry Farm, Etah, under the supervision of Dr. A. E. Slater who is building up a suitable flock mostly by selection.

26. Improvement of Grazing Facilities (paragraphs 181—183).

Assam.—Experience during the period has shown that numbers of cattle grazing in forest reserves can be controlled because the number of forest villagers admitted is controlled. In other State grazing reserves control of numbers has been found to be difficult. Attempts have been made in two 'notified' reserves and are being pressed.

Control of breeding was commenced in three large grazing reserves and is being continued by means of castration of surplus bulls and supply of improved bulls.

Delhi.—The action mentioned in the report for 1931 was continued.

Madras.—In divisions in which facilities for watering cattle were inadequate, the department continued to provide them by sinking new wells and repairing old one as far as funds permitted. In cases in which the ryots desired to improve existing water sources they were permitted to do so. A regular programme for improving the water-supply in the Salem circle, estimated to cost Rs. 2,400, has been drawn up for execution as funds become available.

United Provinces—New types of grasses, such as elephant and guinea grass, were introduced in places where conditions were found to be suitable. A survey of the relative fodder value of some two dozen species of grasses is in progress. Closure to grazing were imposed in young plantations only or with the definite object of improving grazing in future. A rotational grazing has been adopted in the *kholes* of the Siwaliks and additional grazing facilities provided in the Salanpur forest division.

27. Promotion of the use of Silage (paragraph 185).

Assam.—Silage is made and used with great advantage on four Government farms. But no private individual has adopted the practice.

Bengal.—Both pit and ground silos have been successfully introduced in the Government farms. The department has also published illustrated leaflets showing the methods of construction of silos and preparation of silage.

Bombay.—Propaganda for the manufacture and use of silage is being carried on. Demonstrations are held annually.

Coorg.—Advantages of ensilage were demonstrated in 1935 at a couple of centres. Leaflets containing instructions as to the preparation of silage were distributed free. Propaganda by means of lectures at the co-operative society meetings and by talks to the ryots at the village visits of the Veterinary Inspector and Veterinary Assistant Surgeons was carried on.

Delhi.—The action mentioned in the report for 1931 was continued.

North-West Frontier Province.—Pit silos and tower silos at Agricultural farms have been started.

United Provinces.—Grass and juar are turned into silage on all agricultural and cattle breeding farms.

28. *Investigation of the correct period at which to harvest cereals (paragraph 186).*

Bihar and Orissa.—Experiments conducted at Kanke on paddy crop have not yet yielded any conclusive results.

Bombay.—Work in this connection is in progress at the Agricultural Research Station, Sakrand.

United Provinces.—An experiment of this nature was carried out with paddy at the Rice Research Station, Nagina. Definite results will be available after two or three years. The question of starting similar work in connexion with other crops is being looked into.

29. *Encouragement of the cultivation of Leguminous Fodder Crops (paragraph 187).*

Assam.—The well-known acidity of Assam soils makes success in this line doubtful. Cowpeas during the rains and field peas during winter have so far been found to do best.

Baluchistan.—This is being pushed forward as best as possible. Berseem has been introduced while lucerne is an established fact. Shaftal is also finding favour.

Bihar and Orissa.—Cultivation of leguminous fodder crops like berseem and lucerne is advocated by the propaganda staff. A leaflet on berseem has been published. Cultivation of these leguminous fodder crops is gradually increasing.

Bombay.—In the Presidency proper large quantities of lucerne seed have been supplied on demand to cultivators. Soyabean crop has been recently introduced. The introduction of 'Dhaincha' has been found successful in marshy and partly water-logged soils and it is spreading gradually. Trials of 'Berseem' have been conducted in a few places.

In Sind, the Agricultural Department is conducting a series of demonstration plots in the districts on cultivators' lands to illustrate the advantages of leguminous fodder crops in crop rotations and to induce cultivators to undertake their extended cultivation. The cultivation of Berseem *Trifolium Alexandrinum* as a leguminous fodder crop in the rabi season is extending in the Barrage areas. Special agricultural leaflets on leguminous fodder crop cultivation have been issued.

Delhi.—The action mentioned in the report for 1931 was continued.

North-West Frontier Province.—The cultivation of berseem is superseding that of shaftal. The North-West Frontier Province is one of the few parts of India which can produce seed of berseem and the trade in that commodity is becoming a valuable asset. The Department is now paying special attention to the cultivation of summer fodder crops.

United Provinces.—In areas where irrigation facilities exist the cultivation of lucerne and berseem is gaining some ground, but the general adoption of these crops is limited by the small size of holdings.

30. *Progress made in establishing pure and improved types of good cattle (including buffaloes) with special reference to the policy of producing "dual purpose cattle" (paragraphs 188—198).*

Assam.—Reduction in size and milk yields of Scindi cattle and other up-country breeds of cattle bred locally, as compared with the imported stock, was noticed and may be accepted as a fact. How far the reduction will proceed is not yet known.

Khanapara and Sylhet Cattle Breeding Farms.

The work continued on lines already reported with good results. The total stock is 420 head.

Upper Shillong Farm.

The breeding of a European × Indian crosses for milk production in the hills continued. A good measure of success was attained, lactations of over 8,000 lbs. being achieved in the fifth year of the breeding work. The total stock is 100 head.

Jorhat Farm.

The breeding of a local herd of a grey type was continued and a size has been reached where it is possible to use a Hariana bull for breeding. There is every hope of a type suitable for heavy cart work emerging with a cow capable of yielding 2,000 lbs. of milk in a lactation as against the local with 500 lbs. Two selected village breeding areas and three large grazing reserves, where subsidised bulls are maintained, have been in operation.

A system of issue of bulls on loan to Local Boards, Municipalities and private breeders has also been in operation.

Bihar and Orissa.—The Sahiwal and Tharparkar herd maintained at the Kanke Farm is now reaching a high standard of production. The Tharparkar breed promises to produce a useful dual purpose cattle.

Bombay.—In the Presidency proper this work has extended so rapidly that the Agricultural Department are now not able to meet the demands made on them for bulls.

In Sind, a scheme for the improvement of the Tharparkar breed of cattle as a 'dual purpose' breed for extension in the Barrage areas has been approved by the Government of India.

Goorg.—Two Scindhi bulls are stationed, one at Mercana and another at Ammatti, for stud purposes. Upon a scheme put up in 1933 to the Imperial Council of Agricultural Research to improve the cattle in the Province—the Animal Husbandry Expert to the Council and the Imperial Dairy Expert visited Goorg during March 1935 to decide upon breeds most suited. They have chosen the Amritmahal breed for a few of the eastern villages, the Gir breed for the South Eastern part of the country and the Scindhi breed for the rest of the country. They have concluded that buffaloes will also thrive well and suggested Murra breed. A note laying down the lines of work was received at the close of the year. A scheme has just been put up to carry the suggestions into effect.

Delhi.—Attention is invited to the remarks in the report for the year 1931. 41 cows and 2 buffalo bulls were purchased. In addition, 9 cows and 15 buffalo bulls were approved by the Veterinary Department out of the bulls let loose by the public. Much progress has been made by the three Sub-Committees at Nangloi, Mehrauli and Shahdara, formed to consider measures to control Brahmani bulls. Further sums of Rs. 6,000, sanctioned by the Local Government and Rs. 1,000 provided by the District Board, are being utilized for the purchase of more cows and buffalo bulls.

North-West Frontier Province.—Some years ago the Province was not able to produce its own plough bullocks with the necessary vigour and stamina. Now, as a result of the Phanni Cattle Breeding Scheme plough and cart bullocks are locally produced. On 31st December 1935 there were 178 Dhanni stud bulls which covered 27,138 cows.

Punjab.—The local Government have continued their policy of supplying pedigree bulls to breeders at concession rates from the Government Cattle Farm, Hissar; 724 and 613 bulls were issued in the years 1934 and 1935, respectively, representing an indirect subsidy to cattle-breeding of Rs. 2,39,135. Live-stock improvement schemes subsidised by Government are in operation in the areas most suited to cattle-breeding, including the Dajal, Hariana and Dhanni cattle tracts. The task of surveying the different breeds in the Province is near completion. The Veterinary Department's scheme for the concentration of bulls in selected areas continued to receive special attention.

The number of pedigree bulls now working in the districts under the supervision of the Veterinary Department amount to 4,686, compared with 4,637 in the previous two years. This number does not include a large number of privately owned approved bulls which are registered at different veterinary hospitals, with a view to supervision by the Veterinary Department.

The large number of castrations done by the Veterinary Department during the period under report is an indication of the very great importance attached to this work in grading up village cattle.

The buffalo breeding industry continued to make steady progress. The Veterinary Department is fully alive to the importance of the buffalo as a ghee producer and continues to concentrate attention on the revival of the different indigenous breeds as found in special areas of the Province. Buffaloes are definitely increasing in numbers at the expense of cows in areas where facilities for grazing are becoming more restricted owing to the spread of cultivation.

United Provinces.—Work is in progress to adapt the Sahiwal breed and the Murra buffalo to local conditions for milking purposes, and the Hariana breed for both draught and milking. Work has also been started on the Kunwaria breed in order to find a suitable animal for grading up the Bundelkhand cattle.

During the last seven years, Government cattle farms have supplied 806 bulls out of a total 3,772 issued by the department. The work of building up of pedigree stock continues at the farms.

31. *Improvement of the Urban Milk and Ghee (clarified butter) supply (paragraphs 190—201).*

Assam.—The supervision of co-operative milk concerns was continued. Five concerns were working. The experience is that where financing of societies in order to create production of milk is necessary the return in milk produced will not meet interest and loan repayment charges. Where milk already exists the organisation of co-operative transport and sale is successful and appreciated. Twenty-five milk societies and two Co-operative milk societies unions are working at present.

Bombay.—The improvement of the ghee trade and the more economic and scientific methods of converting milk into milk products are now well in hand. Four centres for this work have recently been created.

Delhi.—Attention is invited to the remarks in the report for the year 1931. While purchasing or approving bulls care is taken to see that they are of improved milk strain.

Madras.—Till 1933, the Madras Prevention of Adulteration Act, 1918, was in operation in 17 local areas. With effect from December 1933, the Act was extended to 30 more local areas, municipalities which had either a Health Officer or a Commissioner. Thus the Act is now in force in almost all the important towns in the Presidency. While a total of only 6,054 samples were examined during 1932 and 1933, the number of samples examined during 1933-34 was 11,249, nearly twice that of the previous two years. During 1934-35, the percentage of adulteration in ghee samples was 44.8 and 65.0 in samples of milk.

There are no ghee supply societies in the Presidency.

The Madras Co-operative Milk Supply Union is making steady progress. During 1933-34 and 1934-35 it realized Rs. 1,11,981 and Rs. 1,35,664 by the sale of milk and milk products and earned a net profit of Rs. 2,411 and Rs. 4,667, respectively. It supplies milk to hospitals and the number of private consumers is increasing appreciably. Steps are being taken to secure a suitable plot for the installation of a plant for pasteurizing milk. The union is also contemplating taking on lease kanchas (pasture lands) to enable its members to maintain their dry cows till they calve again.

North-West Frontier Province.—To improve the milk strain of local cows and buffalo cows, stud bulls of Montgomery and Nili breeds were located in the urban areas of the Province. On 31st December 1935 there were 4 and 30 stud bulls of Montgomery and Nili breed respectively which covered 6,431 cows. The results achieved from the Montgomery and Nili Breeding Schemes are very satisfactory.

Punjab.—With a view to improve the milk supply of urban areas, Montgomery bulls as well as buffalo bulls were supplied to various municipalities and Small Town Committees.

United Provinces.—Steps are being taken to introduce heavy milking buffaloes from the Punjab in some co-operative societies. The number of ghi societies is now 35. Two milk supplying schemes are working satisfactorily.

The number of samples of milk and ghi taken by public health officers under the United Provinces Prevention of Adulteration Act increased considerably.

32. *Organisation of Co-operative Breeding Societies (paragraph 202).*

Bombay.—Although there are no special co-operative breeding societies in the North-Central Division, the improvement in the breed of draught animals has been undertaken by three Taluka Development Associations in Khandesh.

There are in all 14 cattle breeding societies in the Southern Division. Those situated in tracts having good grazing facilities are doing fairly well.

Central Provinces.—It has not been found possible to organize any such society.

Delhi.—The only society in Sahibabad Daulatpur is doing useful work. Efforts are being made for the formation of a society in Mitraon near Najafgarh.

Madras.—There are no breeding societies in the Presidency.

Punjab.—Sheep breeding societies have made no progress. Cattle breeding societies are increasing in 1934-35 from 146 to 162. The movement is particularly active in the Amritsar district, where there are 34 societies. Buffalo breeding societies have also been started in an area which is celebrated for the quality of its stock, and promises well.

United Provinces.—Pedigree breeding bulls continue to be supplied to such co-operative societies as ask for them. No co-operative breeding societies, however, have yet been formed.

33. *Live-stock Shows and Fairs (paragraph 203).*

Assam.—Departmental cattle were exhibited at several shows and Agricultural Exhibitions. This is found to be too expensive to be attempted very often.

Baluchistan.—A Horse and cattle show is held annually at Sibi. Horse and donkey shows were held at Quetta during 1934 and 1935.

Bombay.—In the North-Central Division, two cattle shows were held. In the Southern Division, 18 cattle shows were held and prizes were distributed to owners of good animals.

In Sind at large agricultural shows, *e.g.*, the Jacobabad Horse Show, live-stock sections are organised by the Agricultural Department.

Coorg.—Cattle shows at Fraserpet, Rampura and Gonicoppal were held as in the previous years. One more show was started at Samvarsante with great success. Grants amounting to Rs. 860 were made for award of prizes to the best exhibits.

Delhi.—In 1935, 6 cattle shows were held in six villages and Rs. 600 were given in prizes. It is hoped that the holding of such shows will foster a desire to possess improved cattle.

Punjab.—The number of cattle fairs is increasing. During the years under report, 268 cattle fairs (excluding one-day shows) were held.

Cash prizes were awarded as usual at live-stock shows to stimulate interest amongst breeders.

North-West Frontier Province.—Six cattle-fairs and horse-shows were held in the Province in Peshawar, Hazara, Kohat and Dera Ismail Khan districts. Some more live-stock exhibitions were also held in Peshawar district in connection with village uplift work. The effect in regard to live-stock improvement of these shows was excellent.

United Provinces.—Cattle shows and fairs are usually held along with agricultural shows.

34. Castration (paragraph 207).

Assam.—Extensive castration of weedy bulls as a measure towards improvement of stock was continued.

The number of castrations performed by the Live-stock Department was 705. The Veterinary Department castrated 23,873 in 1933-34 and 23,222 in 1934-35.

In addition to the Veterinary staff, 4 Agricultural Inspectors, Live-stock, appointed during the period under report, castrate surplus and undesirable bulls found in the neighbourhood of departmental bulls issued for public use.

Bombay.—The rules under the Live-Stock Improvement Act were framed in 1935. The question of selecting areas where compulsory castration of scrub bulls can be enforced is under the consideration of the Local Government.

Central Provinces.—152,308 and 164,723 castrations were performed during the calendar years 1934 and 1935, respectively, against 110,493 and 118,026 during 1932 and 1933. The operation was undertaken on a voluntary basis mainly in young stock. The time is not ripe for compulsion in this respect.

Coorg.—Castration of scrub bulls with Burdizzo's bloodless castrator was carried on with all vigour. 1,197 heads were castrated during the year.

Delhi.—The castrations performed in 1934 and 1935, numbered 5,844 and 6,240 respectively.

Punjab.—The castration of inferior male stock amongst cattle, sheep and goats was carried on as zealously as before. 1,190,089 castrations were performed by the Subordinate Staff during this period against 869,870 in the previous two calendar years. In selected breeding areas, special attention is paid to this work by the district staff.

North-West Frontier Province.—One lakh six hundred and forty-four castrations were performed. The castration of scrub bulls helped a good deal in the improvement of local cattle.

United Provinces.—Over 5,000 inferior bulls were castrated during the past two years. The elimination of *non-de-script* bulls from the areas where Government stud bulls are working had a marked effect on the village cattle.

35. Control of Live-stock improvement (paragraph 208).

Assam.—The post of temporary Live-stock and Dairy Expert has been converted into that of a permanent Deputy Director of Agriculture, Live-stock, Assam.

Delhi.—The figures of castration and the number of stud, purchased and approved during the years under report show that considerable progress has been made in improved live-stock in the Province.

Madras.—Please see the report for the period ending 31st July 1929. The question of transferring the control to the Veterinary Department was examined, but the Government have decided to make no change in the present arrangement.

Punjab.—The action taken on this recommendation has already been mentioned in the report for the year 1930. Satisfactory progress has been made, in spite of the great financial stringency experienced during the years under report.

United Provinces.—The control of live-stock improvement is in charge of a Deputy Director of Agriculture.

CHAPTER VIII.—Forests.

36. *Grazing in Forest areas and Fodder supplies from those areas (paragraphs 218-219).*

Assam.—The cattle and buffaloes of villagers living adjacent to reserved forests are in most cases, when there is a demand for it, allowed to graze in the reserves subject to suitable control.

Professional graziers are admitted into grassy areas where this would not be to the disadvantage of villagers.

Professional graziers' cattle in the Aie Reserve are being bred selectively under the control of the Deputy Director of Agriculture, Live-stock. Excellent results are being obtained and the graziers welcome the improvement in their cattle.

The Deputy Director of Agriculture, Live-stock, has also consented to introduce the system of selective breeding amongst the large buffalo herds grazed by professionals in the Laokhowa and Kaziranga Reserves, and the buffaloes grazed by Assamese in the Pani-Dihingia Reserve. The former buffaloes are of the up-country type, but the latter are Assamese buffaloes that have degenerated very sadly in size.

The Legislative Council having passed a Resolution to the effect that better protection should be afforded to the wild buffalo and that the breeding of the indigenous strain of domesticated buffalo should be encouraged, the boundaries have been laid down of an area in North Lakhimpur which it is proposed to reserve for the preservation of wild buffaloes, while domesticated Assamese cow buffaloes will be allowed to graze where they can be covered by wild bulls, as periodic infiltration of wild blood is desirable for the maintenance of this magnificent breed, which is of great size and yields a large quantity of milk.

Government have been requested to forbid destruction of wild bull buffaloes elsewhere in North Lakhimpur whenever they are valued by the villagers as sires.

It is hoped that it will be possible eventually to inoculate against rinderpest all cattle and buffaloes grazing inside Reserved Forests, and a start was made this year in Kaziranga in co-operation with the Veterinary Department.

There is no demand for grass from the reserves except near Shillong in the absence in the Province of stall-fed cattle.

The new grazing rules mentioned in the last report are now in operation.

Twelve thousand three hundred sixty-three acres of additional land were reserved for grazing in the province up to the end of June 1935. Against this, 812 acres were excluded and thrown open for ordinary cultivation.

Baluchistan.—Parts of the State Forests have been opened to grazing in accordance with the recorded rights on a rotational system. To meet the grazing requirements of the villagers as a result of the not infrequent draughts, an area of 216 sq. miles was opened during the years under report against 142 sq. miles in the preceding year, the underlying idea being to improve the quantity and quality of the grasses for the benefit of the people whose main occupation is flock-keeping.

The number of flocks has considerably increased. A scheme to discourage the propagation of goats which are destructive to forest is under consideration.

The number of horned cattle grazing in the State Reserves, though comparatively small, is larger than that in the past. This is a sign of increasing prosperity.

No less than 34,786 maunds of grasses were cut in the Loralai District and parts of the Quetta-Pishin District. This is a record figure for Baluchistan.

Bengal.—The question of the establishment of *bathans* and introduction of stall feeding in the Kalimpong Forest Division could not be given effect to owing to scarcity of funds.

Napier grass continued to be propagated in the Kurseong Forest Division but the fodder has not become popular yet.

Bombay.—The experiment of rotational or controlled grazing in Loni Kalbhori in the Poona Division, to which a reference has been made in previous reports, still continues. In all revised working-plans increased attention is being devoted to the question of grazing and improvement of fodder supplies.

Central Provinces.—To cope with the ever increasing demand for grazing in the Government Forests, the grazing settlements of the Saugor and Nagpur-Wardha forest divisions, denoting with 481,317 acres and 456,885 acres of forests, respectively, were amended when the working plans were revised. By reducing the limiting incidence and the duration of closure, a greater number of cattle have been admitted to grazing. Removal of fodder grass from areas closed to grazing has been permitted at very low rates and every attempt has been made to provide such areas at reasonable distances from the villages.

The grazing rates charged in this province are nominal and very low compared with the prevailing rates in adjoining private forests. Their gradual increase is contemplated, but is held in abeyance on account of the present agricultural depression.

Preservation and improvement of pastures has received the careful attention of the department and an elaborate experiment has been started in collaboration with the Agriculture Department in the Yeotmal forests to determine the optimum grazing closure cycle and incidence compatible with production of timber and fuel on the one hand, and preservation and improvement of pastures on the other. The experiment is progressing very satisfactorily, but it will be some time before conclusive results are available. Frequent rotational closures (3 to 5 years closed and 10 to 15 years open) have already been prescribed in recent working plans.

Coorg.—A liberal policy of providing grazing facilities in forest areas is being pursued.

Madras.—Experiments on the introduction of better strains of grass were continued in several divisions, but the results were generally not satisfactory on account of the failure of the monsoon.

As usual, free removal of grass in headlands was allowed in various divisions. Free grazing and grazing at concessional rates were allowed in divisions in which fodder famine was reported to be acute. In order to relieve the fodder scarcity in the ceded districts nearly 4,000 tons of hill grass were collected by the Forest department for sale to the public at Rs 10 per ton.

Experiments in 'rotational grazing' have been started in selected localities in Coimbatore North and Kollegal divisions. Under this system, it is hoped that the grass will have a better chance of thriving than when grazed throughout the year continuously.

There has been an appreciable increase in the number of cattle licensed to graze in departmental forests and consequently in the grazing revenue.

Punjab.—The action taken on this recommendation has already been mentioned in the previous reports. The experiments for the improvement of grass started in Kulu and Kangra by the Agricultural Department have been abandoned for want of funds.

Three small areas of 5 acres were set aside for experiments in the introduction of new grasses, but these experiments were for various reasons infructuous. On the other hand, the growth of grass has been greatly stimulated in the Hoshiarpur tahsil and in the Hamirpur tahsil of Kangra by closing certain areas to grazing.

United Provinces.—The improvement of grass production and grazing is the definite object of management in most forest areas and a regular system of periodic grazing has already been introduced wherever possible.

To encourage grass cutting as an alternative to grazing, some blocks are closed to grazing and open to grass cutting, the fees charged for the purpose being kept very low. The respective merits of the two methods vary with the locality; experiments in the comparative methods are being carried out. No definite results have yet been reached.

With a view to discourage the grazing of inferior cattle, high fees are charged wherever the condition of the villagers warrants it, except where grazing is actually desired as a measure of fire protection.

Plantations were raised over an area of 816 acres in 1934, and 316 acres in 1935; grazing is one of the main objects in view in the creation of these plantations.

North-West Frontier Province.—Grazing in forest areas is at present either in exercise of a right or as a concession on the payment of fees. In the latter case permits are limited to give a reasonable grazing incidence varying from 8 to 12 acres per head in suitable localities to 15 to 40 acres per head where grazing is poor.

The policy of encouraging grass cutting instead of grazing is being pursued although this action is against the wishes of the majority of the population. No attempt has been made to discourage grazing of inferior cattle.

The cutting and storage of hay is at present uneconomic as the villagers really have enough grass in their own fields and guzaras.

37 Investigation into cost and efficiency of wood and charcoal relative to that of coal (paragraphs 220-221).

Assam.—No investigations have been carried out. There is only a very limited demand for charcoal which, if prepared, is unsaleable to the general public. Firewood is on sale from Reserves at a very low rate of royalty, but is still available from the Unclassed State Forests and private lands in immense quantities.

Baluchistan.—Owing to long years of peace under the British Government the people are gradually settling down. They require cheap timber which is supplied to them in the form of poles from the local forests under the agricultural rules.

The in-flow of large quantities of firewood from the Toba Hills into the Pishin Sub-division and the purchase of Tamarix wood from the Popalzai Reserve Forest by the villagers show that they appreciate the use of good fuel. The major portion of firewood for towns in the Quetta-Pishin District is obtained from Sind. Other districts are served by the local forests.

Efforts are being made to preserve the growing stock and to obtain sustained yield to meet the local requirements permanently. But the main object to conserve forests is to avoid erosion and maintain the natural spring water.

Bombay.—The scheme for irrigated plantation of 10,000 acres in Sind has been held in abeyance pending the creation of a separated Sind Province.

United Provinces.—No figures are available at present for the comparative cost of wood, coal and charcoal. Much depends on the lead from the forest and cost of transport. Some small factories situated near forest areas are using wood fuel in preference to coal and have designed their fire boxes accordingly. It has been found by experiment that, on an average, one unit by weight of coal produces as much heat as 1.9 units by weight of wood.

The comparison between Calorific values of coal and charcoal are given below in terms of calories on 1 grammme of each sample:

Coal.	Calories.	Ash.
Selected Jharin	6,600	11%
1st class do.	6,600	12.6%
2nd class do.	6,000	18%
Deshargrgual	6,650	9%
CHARCOAL.		
Khair (Anacia Catachu)	7,241	2.58%
Tenk (Tectona grandis)	6,661	2.60%
Asna (Terminilia tomentosa)	6,880	4.67%
Sinal (Bombax malabaticum)	6,888	7.41%
Jingan (Odina Wodir)	6,778	6.21%

Afforestation for fuel supplies has hitherto only been found practicable on a few canal banks.

38. Initiation of new and development of existing Forest Industries (paragraph 224).

Assam.—A Forest Utilisation Officer was appointed from July 1st, 1935. He has got into touch with the principal Indian markets not only for timber but also for the large number of articles of minor produce that our forests can supply. Enquiries from Europe have already been received.

Bengal.—Further experiments on tapping of *garjan* trees for *garjan* oil were in progress in the Chittagong Division. The four charcoal making machines, referred to in the previous report, for use in the Kurseong Division, could not be purchased as the financial stringency continued.

Bihar and Orissa.—First in importance among the forest industries of this province is the paper pulp industry. Large quantities of bamboos are taken by Messrs. Heilgers and Company and the Indian Paper Pulp Company, while Messrs. Balmer Lawrie and Company take some 80,000 maunds of sabai grass. The total annual export of bamboos from the forests of this province is some 6,000,000.

The manufacture of Sabai grass rope in the Singhbhum district is being fostered. This is a local industry in Singhbhum and some 12,000 maunds of sabai grass are used annually for rope and mat making.

The revenue from kendu leaves, used by manufacturers of biris, is increasing.

The kutch and catechu industries are increasing in importance, mainly in the Palamau district. The new processes recently discovered at the Dehrn-Dun Research Institute are being tried by contractors in that district.

Efforts are being made to establish the manufacture of broom handles in parts of this province.

Other industries which are being developed are the use of cane and bamboo for furniture work, mat making, wicker comb making, the supply of wood for match factories and the Calcutta Pen and Pencil industry, the development of local timbers for box wood and veneer work.

At the Industrial Exhibition held in Patna in February 1936 arrangements were made for the display of a series of exhibits and for lectures by Forest Officers, to draw the attention of the public to the forest industries of the province.

Bombay.—At the end of 1935 a plot of 40 acres in the Belgaum Division was leased out to certain forest contractors for the purpose of erecting a wood distillation factory to feed which certain adjoining forest coupes have been reserved.

Central Provinces.—(i) *Lac.*—The collapse of the market for this hitherto important minor product in the last six years has destroyed a flourishing business of the Forest Department, which was conducted mainly in the Damoh and Saugor divisions.

Drought and frost in recent years have largely reduced the crop and it will be some time before full productivity is reached again. The income from lac has fallen from Rs. 2,000,000 in 1928-29 to Rs. 21,000 in 1934-35. Departmental propagation and collection are still carried out in Damoh and Saugor, but profits are now small owing to low prices ruling in the market at present.

(ii) *Gum kareya*.—Tapping of kulloo (*Sterculia urens*) trees for gum is a new development. The work is confined at present to the Damoh and Saugor divisions, where 1,800 maunds of gum have been collected departmentally this season and sold at Rs. 10-8-0 per maund. It is understood that the gum is exported to America and Germany, but to what use it is put has not been ascertained. The possibility of increasing the output by extension of the operations to other divisions where the kulloo tree occurs in sufficient numbers is being examined.

(iii) *Semal*.—There is a brisk demand for semal for export to Bombay for the match industry. Enumerations have been carried out in the North and South Chanda divisions in connection with the recent revision of working plans, which indicate that a larger annual output from Government forests will be possible in future. Attempts to create plantations of semal have met with little success, but further experiments are in progress.

North-West Frontier Province.—The Resin industry is being developed to the fullest extent possible and provides work for many people in the Khanpur Ilaga. The collection of medicinal herbs, e.g., violet, maiden hair and belladonna is encouraged.

United Provinces.—The resin tapping industry continues unchanged. The quantity of resin supplied to the manufacturing company was 80,000 maunds in 1934, and 1 lakh maunds in 1935.

Steps have been taken to revive the chir tar industry. Samples of chir tar were tested and the result showed that it is a satisfactory substitute for Stockholm tar for some purposes. It is hoped to be able to build up a market for this product by adopting improved methods.

Match timber was regularly supplied to the Western India Match Company during the last two years. The sales of matchwood logs was nearly 11,000 tons in the last two years.

The post of Forest Utilization Officer is in abeyance at present.

39 *Disforestation of Forest Lands required for construction of Small Irrigation Works (paragraph 225).*

Assam.—There has been no demand for this.

Baluchistan.—Deh Jallo Forest has been disafforested.

Bihar and Orissa.—The local Government are experimenting with a scheme for damming up streams in forests of a dry type to prevent the rapid run of water from steep hills, by diverting it along contour channels. It is intended to spend a sum of Rs. 10,000 in these experiments. It is hoped that the results will be of value not only to the forests but to the agricultural land in the locality. The stream water will be prevented from running to waste and water trickling down the hill sides will be arrested at the contour channels, whence it can reach the main stream only by percolating through the soil in contact with the roots of trees. The indirect benefits expected to be derived from the scheme are the lessening of flood damage, the retention of the water in the soil and the possibility of irrigating land in the vicinity of the forests.

Central Provinces.—No necessity has arisen for this in the Central Provinces.

United Provinces.—An area of forest in the Gonda Division was cleared and leased to the Balrampur Estate for the construction of a dam and storage tank for irrigation. Another area has been recently leased to that Estate for the same purpose.

40 *Control of Shifting Cultivation (paragraph 228).*

Assam.—The Taungya system of shifting cultivation combined with the planting of forest trees is encouraged in the Hill Reserves, but is not attractive whenever there is unexhausted land outside where no restrictions are imposed.

The northern portion of the North Cachar Hills will be examined, it is hoped, before the rains set in, to see if further reservations could not be effected on the banks of the Kopili and its tributaries in order to mitigate to some extent the suddenness of the floods in Nowgong. If Reserves are formed, the Taungya system will be permissible as this does not lead to destruction and denudation.

Baluchistan.—There is no shifting cultivation in this Province.

Bengal.—No definite scheme has yet been framed about the control of shifting cultivation in the Chittagong Hill Tracts. The matter is still under consideration.

Central Provinces.—All cultivation of this nature in the Government forest is done under proper control.

Punjab.—A type of shifting cultivation has arisen in Bashahr in the high level silver fir forests where forest is being cut and burnt for a few years of cultivation after which the land is abandoned. It may be necessary to demarcate up to the limit of tree growth in order to stop this practice.

United Provinces.—Cultivation under the Taungya system (the raising of forest crops in combination with controlled shifting cultivation) increased from 4,000 to 5,000 acres, and additional culturable land was thus provided for poorer agriculturists.

41. *Classification of Forest Areas (paragraph 229).*

Assam.—Good progress has been made in Sylhet where the need of land for settlement is the greatest.

Baluchistan.—The forest areas have already been classified and need no revision. Area under Reserved and Unclassed Forests is 342 sq. miles and 472 sq. miles respectively.

Bengal.—In the Sundarbans Division 4,132.86 acres of Protected Forests were disforested.

Central Provinces.—The reserved forests of the Central Provinces have now been reclassified according to the relative importance in each area of the production of timber and fuel on the one hand, and the satisfaction of the grazing demand on the other. The reclassification into types and the grazing incidence permitted in each type are as follows:—

A. Tree forests, in which the production of trees is the primary object of management and grazing restrictions will be regulated by the silvicultural requirements of the forest.

(i) *Moist type.*—Over 45 inches annual rainfall: heaviest incidence permitted four acres per head.

(ii) *Dry type.*—Under 45 inches annual rainfall: heaviest incidence permitted three acres per head.

B. Scrub forests, in which the preservation and improvement of the pasture are the primary objects of management. Here the grazing restrictions should have the preservation and improvement of the pasture as their chief object.

(i) *Pasture forests.*—Heaviest incidence permitted one acre per head.

(ii) *Open pastures.*—No restrictions of incidence: rotational closures to be arranged for.

United Provinces.—Forest areas are already classified in these provinces.

42. *Establishment of village forests (paragraph 230).*

Assam.—There are now no village forests.

Bihar and Orissa.—In those parts of this province in which a considerable area of forest is found, the tenants as well as the landlords usually have rights in the forests. The extension of cultivation and the increasing demand for timber and fuel have led to destructive competition between landlords and tenants, each party attempting to establish its rights and to get as much produce out of the forests as possible ahead of the other. The result was that forests, especially in the Chota Nagpur Division, were rapidly disappearing or being seriously impoverished. In order to prevent this competition and to give an incentive to the villagers as well as to the landlords to look after their own property it was decided, when the revision settlement operations were started a few years ago in the district of Ranchi, to attempt a form of partition of the forests by amicable arrangement between landlords and tenants. Where no partition of this kind could be effected, the parties have, in some cases, been induced to set aside certain areas of forests as a common reserve, in which both parties will have rights and obligations. In view of the impoverished condition of the forests, the parties have agreed in nearly all cases, including the cases of common reserve, that there shall be no cutting of timber for a period of 15 years in the forests, and that after that time the forests will be exploited only subject to the advice of officers of Government. In all cases the parties have agreed that there shall be no further destruction of forests in the reserved blocks for the purpose of cultivation.

In most villages a panchayat has been appointed for looking after those portions of forests which fall in the villagers' share, and in order to ensure that these village forests shall be properly looked after, Government have appointed a special staff of forest rangers, who are aboriginals of the district and whose duty will be to tour round inspecting village forests and to give advice. These rangers are now undergoing forest training.

The total area thus set aside as village forest in the Ranchi district is 268 sq. miles. The area set aside as common rakhat in which landlords and tenants have equal rights, about 38 square miles. Experiments on the same lines have been made in other districts of the province.

Bombay.—The Bombay Village Panchayat Act having recently been liberalised, draft rules providing for the transfer of village forests to Panchayats and for the regulation of management thereof by the Panchayats are under consideration. Wherever there is a genuine desire on the part of Panchayats to manage such forests, the request is considered sympathetically.

Central Provinces.—As the provisions of the Indian Forest Act are not applicable to the raiyatwari forests, and as such their proper control was not possible, they have now been declared "protected" forests under the said Act.

Management of certain "C" class forests in Berar by village panchayats has been attempted. A year's experience has shown that such management is neither liked by the panchayat nor the villager and reversion to management by the Forest Department has been urged.

North-West Frontier Province.—The more valuable chir guzara forests in the Mansehra Tehsil are being brought under a simple form of working plan.

United Provinces.—Twenty-nine new panchayati (village) forests were established in Kumaun during the last two years, the total number of such forests up to the end of 1935 being 114, covering 14,493 acres.

The services of the Special Panchayat Officer were further retained till the end of February 1936.

A small demonstration area was started in 1934 in the Fyzabad District where the court of wards is actively co-operating in maintaining it and raising similar nursery stock, chiefly of teak, neem and bamboo, for the benefit of estate zamindars.

43. *Creation of Minor Forest Divisions (paragraphs 231-232).*

Assam.—One new minor forest division, *viz.*, Haltugaon, has since been created by splitting the Goalpara Division into two, *i.e.*, the Kachugaon major Division and the Haltugaon minor Division.

North-West Frontier Province.—No decision has been reached on the proposal to create a forest division for the management of the guzara forests which remain under the control and management of the Deputy Commissioner.

United Provinces.—No action in this respect was taken as the afforestation division corresponds to a minor forest division.

44. *Institution of short courses in agriculture for newly recruited forest officers (paragraph 233).*

Assam.—There does not seem to be any necessity for this.

Central Provinces.—No officers have been recruited to either the Imperial or Provincial Forest Service for the last six years.

Punjab.—No Forest officers have been recruited for the last 5 or 6 years.

United Provinces.—There has been no recruitment of forest officers in the last two years.

CHAPTER IX.—Diseases of Live-stock and their control.

45 *Adoption of Serum-simultaneous method of Inoculation against Rinderpest (paragraphs 237-244).*

Assam.—The serum-simultaneous method of inoculation was undertaken in Government Cattle Farms and in a privately owned Dairy Farm in respect of the English or crossbred English Cattle. For the local breeds of cattle experiments are being carried on with the goat virus alone method of inoculation. By this latter method the number of inoculations done rose from 2,773 in 1933-34 to 20,896 in 1934-35 and 21,270 from April to December 1935.

Bihar and Orissa.—During the period under review inoculation by the serum simultaneous method was again carried out only in Singhbhum district where 56 head of cattle belonging to the Tata Iron and Steel Company Limited was protected.

As noted in the previous report the new method of immunization by 'Goat Virus Alone' method was adopted on a wider scale in all districts of the province with satisfactory results. The cost of protection by this method which is gradually becoming popular among live-stock owners, is very cheap and the process simple.

During the last two years, 488,624 animals were protected by this method.

Bombay.—In the Presidency proper vaccination has been adopted as a prophylactic measure against rinderpest. The vaccine is now prepared at the Bombay Veterinary College. Serum-simultaneous inoculation will only be undertaken in exceptional cases and for the protection of imported cattle.

In Sind, adapted Goat Virus (blood) inoculation against Rinderpest was carried out in 10 outbreaks in the year 1934, when 1,523 bovines were successfully protected. Goat Tissue Virus solution is now being used in as many outbreaks as possible. In 1935, 5 severe outbreaks were brought under control by this method. In these outbreaks 852 bovines were inoculated and only 17 died. A Goat Virus Producing Station has been opened at Karachi from December 1935 and virus prepared at this station is available for use in fields of work immediately on demand.

Central Provinces.—This method of protection of cattle against rinderpest has been discontinued as pointed out in the last biennial report. The goat-adapted virus vaccination for the control of rinderpest was perfected and over one hundred thousand animals have been vaccinated by this method. Experiments on what is known as the tissue-virus method of vaccination against rinderpest have also been undertaken, which bid fair to be successful.

Coorg.—Serum-simultaneous method of inoculation both with bull and goat virus and goat tissue vaccination also was carried on with great success in preventing the spread of disease. People have begun to appreciate its benefits and seek it. The treatment is generally rendered free.

Delhi.—The serum-simultaneous method of inoculation against rinderpest which is being tried in the Punjab will be introduced in the Delhi Province in an improved form by goat virus inoculations.

Punjab.—The Veterinary Department continued to focus attention on the necessity for control measures in dealing with contagious diseases, and held periodic discussions with local bodies with a view to create a better understanding of the problem.

Rinderpest vaccination has been gradually extended and is now being employed as the sole control method of dealing with outbreaks in the Lahore and Jullundur Revenue Divisions. The results are most encouraging.

North-West Frontier Province.—The Rinderpest Vaccination campaign with goat tissue virus was started in November, 1935 and during the months of November and December 1935, 7,998 cattle were immunized by this method.

United Provinces.—The serum simultaneous method of inoculation against rinderpest was adopted in 852 cases, while inoculation by goat blood virus was carried out in 19,335 cases. The tissue virus method of immunisation has been introduced, and 113,693 animals were successfully inoculated by this method. Inoculation is carried out free of charge.

46. *Compulsory inoculation (paragraph 244).*

Assam.—There is no legislation for such a course nor is it considered expedient to recommend it at this stage.

Central Provinces.—Besides making inoculation compulsory in the case of animals that are permitted to graze in the forest grazing areas, as already reported, the Central Provinces Cattle Diseases Act was passed in 1935. By this Act power has been taken to prohibit the import into the province of unimmunized and peripatetic herds of cattle which are responsible for the dissemination of infection, particularly that of rinderpest. Provision has been included in the current year's budget for the establishment of four quarantine stations that are necessary to bring the Act into force.

Coorg.—No occasion has arisen for compulsory inoculation.

Madras.—The anticipations in regard to the establishment of a Serum Institute in Madras, in pursuance of the policy of protecting cattle by the serum simultaneous method on an extended scale recommended by the Royal Commission on Agriculture, have been fully realized.

In addition to anti-rinderpest serum and bull virus prepared and issued, goat virus was also prepared and issued for protection against rinderpest. The following figures will be of interest:—

	Number of doses issued during	
	1934.	1935.
(1) Anti-rinderpest serum 5 c.c. doses	1,388,600	1,124,750
(2) Rinderpest bull virus 1 c.c. dose	203,825	157,025
(3) Rinderpest goat virus 1 c.c. dose	21,775	68,350

The Serum Institute has also initiated and carried out a certain amount of research and experimental work for the manufacture of anti-Haemorrhagic Septicaemia serum. It is hoped that, in course of time, this institute will be in a position to manufacture and supply most of the serum and vaccine intended for the prevention and control of contagious diseases in the Presidency.

The protection of cattle against rinderpest by the goat virus method of vaccination was given an extensive trial in villages in the absence of the disease. The results of the trials have shown that this method can safely be adopted in place of the serum simultaneous method on cattle in free areas, though it cannot yet be said that the method is satisfactory in the case of buffaloes. The results also indicate that the animals vaccinated with goat virus do not form fresh centres of infection. Hitherto, only District Veterinary Officers were permitted to carry out the vaccinations with this method, but Government have recently permitted certain selected Veterinary assistant surgeons also to perform these vaccinations.

The Veterinary Investigation Officer sanctioned for this Province by the Imperial Council of Agricultural Research first took up experiments on the use of goat virus in immunizing cattle against rinderpest, and followed this by taking up black-quarter as the next subject for investigation. Though this was the main disease investigated by him, preliminary investigation was also undertaken on bacterial diseases, virus diseases, Protozoan diseases, Fungoid diseases. Parasitic diseases. Deficiency diseases and Poisoning.

North-West Frontier Province.—Public opinion in this Province is still averse to such compulsion.

United Provinces.—Compulsory inoculation is still not considered practicable.

47. Increased provision of Veterinary Hospitals and Dispensaries (paragraph 248).

Assam.—There is nothing new to report save the appointment of a Veterinary Assistant Surgeon under the Nowgong Local Board.

Baluchistan.—No extension has been possible owing to lack of funds.

Bihar and Orissa.—During the period two new veterinary dispensaries—one in Patna and another in Cuttack district—were opened in addition to the one at Tikari in Gaya. The District Board, Champaran, have since resolved to open two additional veterinary dispensaries. Treatment of live-stock at field veterinary dispensaries opened at important centres in addition to the regular veterinary hospitals and dispensaries has become very popular and the number of cases at these dispensaries is rapidly increasing.

Bombay.—One additional veterinary dispensary was opened in the year 1934, bringing the total number of such dispensaries to 106 on December 31st, 1935.

Central Provinces.—There is only an increase by one (103 to 104) in the number of veterinary dispensaries maintained during the period under review. The demand for opening more dispensaries is great, but the initiative should come primarily from the district councils who maintain these dispensaries.

Delhi.—A dispensary has been opened, as an experiment, at Narela, and if successful, it will be converted into a hospital. Twelve outlying dispensaries have also been added to the Veterinary Hospitals at Shahdara, Nangloi and Mehrauli.

Madras.—In the matter of opening new dispensaries, the main consideration was, as before, the ability and willingness of the local bodies which serve the localities concerned to contribute towards the maintenance of such Veterinary dispensaries and the policy was therefore to open as many touring billets as possible, provided finances permitted, on the understanding that the control of contagious diseases are more properly the concern of the local bodies. A Veterinary dispensary was opened at Shiyali in Tanjore district with effect from 1st September 1935. The number of touring billets was increased by six during 1934-35 and by six more during 1935-36.

Permanent buildings have been sanctioned for the Veterinary dispensaries at Dharampuram and Venkatagiri.

North-West Frontier Province.—Fifteen more hospitals and 41 more touring dispensaries were instituted. The opening of these centres at important places has brought veterinary aid within easy reach of the zamindar.

Punjab.—Every effort is being made to provide an efficient network of dispensaries throughout the province. During the period under report, owing to the financial stringency, only 5 new veterinary hospitals were opened, making a total of 299 regular and permanent veterinary hospitals. In addition over 1,100 outlying dispensaries are being attended by the staff in order to provide veterinary facilities to zamindars in the more remote villages.

United Provinces.—Five new veterinary hospitals were opened during the last two years.

48. Reorganisation of Provincial Veterinary Departments (paragraphs 249-254).

Assam.—There is nothing new to report except that a Veterinary Assistant Surgeon has been provided for the Gauhati Laboratory and two temporary Veterinary Assistant Surgeons for virus inoculation work. The Government have provided a Veterinary Assistant Surgeon at Sylhet for the Government Farm and short tours in the district consequent on the reduction of a Local Board Veterinary Assistant Surgeon.

Baluchistan.—Lack of funds again prevented any re-organisation of the Veterinary Department.

Bihar and Orissa.—The financial stringency continued to retard progress in this direction. The Superior Provincial Veterinary Service was, however, created with effect from the 1st April 1935. A sub-range has been opened at Ranchi from the 1st April 1936, consisting of three Chota Nagpur Districts which were formerly included in the Orissa Range of the department. This range has been placed in charge of an Assistant Director of the Bihar and Orissa Veterinary Service, Class II.

Central Provinces.—No progress has been made in this direction. A temporary additional establishment of eleven Veterinary Assistant Surgeons was entertained during 1935 out of a substantial grant given by the Imperial Council of Agricultural Research.

Madras.—A programme of the expansion of the department has been drawn up and is under the consideration of the Provincial Economic Council.

United Provinces.—There has been no change in the position of veterinary inspectors and veterinary assistant surgeons. The province is at present divided into three circles, each under a Veterinary Superintendent belonging to the provincial class II Service, while the Director of Veterinary Services is in general control.

49. *Separation of Agricultural and Veterinary Departments in the Punjab (paragraph 251).*

No remarks have been received from the local Government concerned.

50. *Training of Veterinary Surgeons and Veterinary Assistant Surgeons (paragraphs 255—258).*

Assam.—During 1935, one Veterinary Assistant Surgeon was sent to the Imperial Institute of Veterinary Research, Muktesar, for post-graduate training and he is now engaged in the Gauhati Laboratory. The Superintendent, Civil Veterinary Department, Assam, and the Veterinary Investigation Officer, Assam, visited the Vaccine Dépôt of the Government of Bengal to see the method of preparation of Rinderpest Goat Tissue Virus.

Bihar and Orissa.—The Post Graduate class attached to the Bihar and Orissa Veterinary College was temporarily suspended during the year 1934 as no subordinate officer of the department could be spared from duty for this training. It was, however, reopened in 1935 with a shorter course of three months' duration. Nine students, including two private students, went through the course.

Bombay.—No change has yet been effected in the curriculum of the Bombay Veterinary College.

Central Provinces.—Ten scholarships were awarded to Central Provinces students in 1934 and seven in 1935. One officer of the subordinate grade was deputed for a short course of training at the Imperial Institute of Veterinary Research, Muktesar.

Madras.—The four scholarships tenable at the Madras Veterinary College are distributed as follows:—

Three scholarships to the members of the depressed classes, one scholarship to a poor and deserving Muhammadan.

The Government have sanctioned the institution of the B. V. Sc. degree course in the Madras Veterinary College subject to recognition by the University. The degree course will be inaugurated in July 1936.

North-West Frontier Province.—On 31st December 1935 there were 13 students of this Province who were studying the Veterinary Science at the Punjab Veterinary College, Lahore, and the Bihar and Orissa Veterinary College, Patna.

A Veterinary Class was started at Peshawar to give preliminary training in Veterinary work to Veterinary Stock Assistants and Compounders.

One Veterinary Assistant Surgeon was deputed to the Punjab Veterinary College, Lahore, for the Post Graduate Course. Another was sent to the Government Cattle Farm, Hissar, for special training in Animal Husbandry. Two more Veterinary Assistant Surgeons were deputed to the Imperial Institute of Veterinary Research, Muktesar, for training in Goat Tissue Virus preparation, and one official underwent a training in Dairying at the Imperial Institute of Dairying at Bangalore.

United Provinces.—There is no veterinary college in the province, but a higher standard of qualifications and of training is demanded from candidates for the post of veterinary inspector than for veterinary assistant surgeons.

51. *Research work in Provincial Veterinary Colleges (paragraph 261).*

Assam.—The Veterinary Investigation Officer, Assam, who was appointed in 1933 and underwent a post-graduate training in the Imperial Institute of Veterinary Research, Muktesar, in the same year, carried out during the last two years investigations resulting in valuable findings. Specific instances are—detection of a Micro-filaria as the cause of hump-sore in cattle and detection of cutaneous Leishmaniasis in cattle. Further investigation is in progress.

Bihar and Orissa.—Research work in Kumari was continued during the period under review, special attention being given to the study of the histopathology of the nervous system in the disease. A malarial parasite (hoemoproteus) was discovered in an Indian peacock.

Experiments were also carried out to test the value of Carbon tetrachloride in the treatment of Nematode infestation in cattle. The results were successful. Experiments carried out to test the viability of goat spleen tissue and goat blood virus showed that they can be kept potent under suitable conditions up to 22 days.

Bombay.—The position at the Bombay Veterinary College with regard to research is unchanged. A certain amount of work has, however, been done in connection with the viability of rinderpest virus in the spleen tissue of goats. Recently, the preparation of virus for the protection of cattle against rinderpest has been undertaken at the College.

The Veterinary Investigation Officer has continued his investigations into the diseases of live-stock in the Presidency. His work has followed the lines mentioned in the last report and in addition a study of the incidence of tuberculosis and John's disease and of certain protozoan diseases of cattle has been made.

Central Provinces.—No college exists in this province, but field research work is being undertaken by the Disease Investigation Officer and his work is being constantly reviewed by the expert staff of the veterinary department and of the Imperial Council of Agricultural Research.

Madras.—The following items of research work were undertaken at the Pathological and Parasitological sections of the Madras Veterinary College Laboratory.

Pathology section.

(1) *Pseudo-Fowl pest.*—Some experiments were conducted to immunize birds against the disease with a vaccine prepared from the brain material of the infected birds. The results obtained were not encouraging.

(2) *Black-Quarter, Anthrax and Haemorrhagic Septicæmia.*—Biological tests were conducted for Black-Quarter, Anthrax and Haemorrhagic Septicæmia.

(3) *Anterior Pituitary Hormone.*—During 1933-34, urine hormone from pregnant cows was prepared and tried in the field. Thirteen animals were treated with the hormone, of which one was treated twice. The reports received so far have not been encouraging.

Parasitology section.

(1) *Nasal Schistosomiasis.*—To confirm the results of previous experiments, attempts were made in 1933-34 to produce the disease artificially by smearing, first Cercarie of *S. Spindalis* and later Cercarie indiens XXX on the nasal mucous membrane of a calf and observations were recorded during the year regarding the same.

During the course of examination of the sections of horn growth from bovines suspected for epithelioma, it was possible to see in one of the growths certain bodies which looked like ova of nasal schistosomes in follicles. A systematic examination of nasal washings received from the Veterinary Assistant Surgeon posted on special duty in the Chittoor taluk on Nasalgranuloma work was carried out at the College laboratory.

(2) *Gnathostome infection.*—In one dog, ova of these parasites were seen in the cases and advantage was taken of this to study the life history of this worm which is liable to infect man.

(3) *Cutaneous myiasis in animals.*—This work was taken up from December 1934 with a view to study the kinds of flies that produce cutaneous myiasis in animals in South India and their seasonal incidence, etc.

(4) *Rhinosporeidiosis.*—A series of trials with fresh materials was made to infect calves without success.

(5) *Streptothricosis.*—It was possible to isolate and study the cultural characters of a species of streptothrix from the lungs and liver of a dog that died in the Veterinary Hospital, Bellary.

(6) *Calcercous nodules in the liver and lung of horses.*—Schistosoma indicum is reported to cause persistent debility in horses. To verify this, lungs and livers of jatka ponies destroyed for the operative surgery and anatomy classes were examined.

Punjab.—Investigational work into local disease problems continued during the years under report, details of which are furnished in the annual reports of the Veterinary Department.

Short courses of instruction, including a course on Rinderpest vaccination, were given to the Subordinate Staff at the Punjab Veterinary College.

Experiments were undertaken in the Statement of Surra in horses by single doses of Nrganol with encouraging results. Some experiments on the prophylactic use of Naganol against Surra, were tried on dogs, and as the result obtained were found satisfactory, it is intended to extend the experiment to horses.

A scheme for determining the most suitable and economic methods of combating different types of parasitic infections in ruminants in the field is in progress at the Punjab Veterinary College. Concurrently with these experiments an effort is being made to determine whether certain mineral deficiencies tend to lower animal resistance towards parasitic infestation conclusions. This scheme is being financed from the funds of the Imperial Council of Agricultural Research.

United Provinces.—Research and experimental work continues to be carried on in the laboratories attached to the office of the Director of Veterinary Services, under the supervision of the Veterinary Investigation Officer.

"Fascioliasis" among cattle was controlled with "Carbon Tetrachloride" to a considerable extent. Experiments showed that antimosin had a beneficial effect on the course of "barsati" and "Nasal granuloma", and that this product was superior to tartar emetic. Experimental treatment was undertaken to test the value of Colloidal Iodine as a vermicide, and the result is encouraging. It seems that this drug has great possibilities as an efficient poultry enthelminthic.

Serodiagnostic tests with regard to "Bovine contagious abortion" were carried out. The findings have an important significance from the public health point of view. *Brucella Melitensis* and *Brucella Abortus bang* are responsible for causing Malta fever and Undulant fever respectively in human beings.

Experiments for the treatment of Eczema in dogs were carried out by the intramuscular injection of "abijon" with a certain amount of success. Investigation was also undertaken to solve the problem of heavy loss of pedigree dogs, particularly Alsations, of the Bhadri Kennels in Partabgarh.

No definite results have yet been obtained.

CHAPTER X.—Irrigation.

52. Review of position in regard to outstanding Irrigation Projects (paragraph 275).

Assam.—In the Surma Valley there are large areas of precarious deep water paddy land. On account of frequent floods and water hyacinth the necessity of growing spring rice under irrigation in such areas was keenly felt. Preliminary trials with pump irrigation were very successful. Recently the Local Government sanctioned Rs. 20,000 for the purchase of pumps from the rural uplift grant of the Central Government. Ten pumping sets were purchased for further demonstration. About half a dozen pumps are being supplied to private individuals on the hire-purchase system.

An officer of the department was put on special duty towards the end of the year 1935 to study the possibilities of reclaiming certain areas for the successful cultivation of paddy.

Baluchistan.—The position is the same as that reported previously (Report for the year ending 31st December 1930). Only small village schemes were investigated and works carried out as funds permitted.

North-West Frontier Province.—The Paharpur Canal extension was sanctioned at the end of 1934 and a loan obtained from the Government of India. It is nearing completion and a perennial supply will be available from the Kharif crop, 1936.

The following projects are also under consideration:—

1. Tank Zam control.
2. Control of the Gumal.
3. Lift Irrigation of the area near Risalpur.

The works as per items 1 and 2 have been investigated, but held up for want of funds. The work as per item 3 is under investigation.

United Provinces.—The project for a weir on the Shahzad nadi in the Jhansi Division has been postponed as less urgent than another for a new reservoir on the Dhasan River at Khutgaon which will be constructed as soon as funds permit.

A rough project for a reservoir on the Barma River in Bundelkhand to irrigate the Trans-Barma tract was prepared, but the scheme was dropped finally as it could not prove a financial success.

A scheme for a canal for irrigating the Ahraura area and another for the construction of the Nindeh reservoir in the Mirzapur District are under consideration.

It has been decided to undertake the remodelling of the Mat and Hathras branches of the Ganges Canal on a systematic basis. A preliminary estimate has been prepared for constructing certain new minors for irrigating extra areas of land.

Two Development Circles have been started, known as Development Circle (West) and Development Circle (East). In the west, areas not commanded by canals are being provided with tube-wells, and conversion schemes for sinking tube-wells to take the place of canal irrigation thereby releasing canal water for use in areas where the sinking of tube-wells is a geological impossibility have been carried out. In the east, an estimate for a pumping scheme for the Fyzabad District has been prepared and investigation is in progress for providing a pumping scheme for the Partabgarh District.

53. Investigation and experiment on sale of water by volume (paragraph 277).

Bihar and Orissa.—Some progress has been made as regards extension of long term leased areas on the Son and Champaran Canals only.

Bombay.—No satisfactory practical method of selling water by volume for irrigation having been evolved the present procedure of assessing the area irrigated will continue for the present, every effort being made to promote and encourage economy in the use of water by modulating the outlets and educating the cultivator in the more thrifty use of water.

North-West Frontier Province.—A contract has been made for 6 years from Kharif, 1934 with Khan Sahib Abdul Matin Khan of Takhti Bhai to irrigate 1,109 acres of land from outlets on Distributory No. VIII of the Lower Swat Canal on payment of fixed water rate of Rs 4,450 per annum, irrespective of the area irrigated and crops sown. No Kharaba will be given, but if a wide spread calamity occurs, his case will be considered by Government.

United Provinces.—The sale of pumped water by volume, that is, by charging for it according to the number of units of electric current consumed in pumping it, has met with success, and is now in force on practically all tube-wells.

54. Formation of Irrigation Panchayats (paragraph 278).

Bengal.—Draft rules have been framed. At present the working of the Damodar Canal is being watched.

Central Provinces.—Under the Central Provinces Irrigation Act and the rules thereunder, which came into force on the 15th March 1932, Irrigation panchayats exercise certain powers. Collection of revenue by them has been satisfactory but sufficient information is not yet available to indicate whether the distribution of water by them has been popular and efficient.

United Provinces.—The results of the working of village panchayats in dealing with cases concerning wastage of water and complaints about measurements, are considered to be encouraging, and the experiment is being continued. The position will be reviewed shortly.

55 Establishment of a special agency for Minor Irrigation Works (paragraph 279).

Baluchistan.—The suggestions of the Commission are being carried out as far as possible. Subordinate Officers of the Irrigation Department tour in the villages and inspect the sites recommended by the Civil authorities and submit their reports.

Bihar and Orissa.—It is proposed to amend the Minor Irrigation Works Act so as to enable minor irrigation schemes to be taken up.

United Provinces.—Seven hundred and forty-nine tube-wells were constructed in the districts of Meerut, Muzaffarnagar, Bulandshahr, Bijnor, Badaun and Bareilly. A similar number is expected to be constructed by the end of 1937, and the area to be commanded by all of them will be 270,470 acres in *kharif* and 350,880 acres in *rabi* or 621,350 acres annually.

Three schemes to substitute tube-well water in place of river water in the canals of Meerut and Bulandshahr districts have been carried out.

In addition, some 150 tube wells have been constructed in the hydro-electric grid area by the Agriculture Department for zamindars at their own expense, with the help of Government grants or *takavi* loans.

An estimate for a lift minor in the Narora Division, Lower Ganges Canal has been sanctioned. It will convert lift areas into flow.

56. Pumping and Boring Operations and Tube Wells (paragraph 280).

Baluchistan.—A small pumping set was installed at the Sultan Mohd. Karez at mile No. 14 Quetta Chaman Road. A report on this scheme will be submitted next time.

Bombay.—In Sind, the Agricultural Engineering Section of the Agricultural Department has now been equipped for such work which is being undertaken.

Delhi.—There are signs that such boring operations may become popular in the near future.

Madras.—During the two years under report, over 2,200 borings were put down in the Presidency and most of them were successful. The total depth bored was over 125,000 feet, that for 1934-35 being the highest on record. These borings included 23 artesian borings of which special mention may be made of a spring tapped at Neiveli village, 6 miles from Uthangalmangalam railway station, Vriddhachalam taluk, South Arcot district, which yielded a supply of 2,250 gallons of fresh water per minute at 14 feet 8 inches above ground level. The size of bore holes has increased during the last few years, the development of boring practice being in the direction of larger and deeper borings.

Among other measures of assistance rendered by this branch of the department may be mentioned the supply of drinking water to the public during the Ardhodayam festival in February 1935 from borings put down by the department for the purpose in the Vedaranyam area of the Tanjore district.

The department possesses a number of portable pumping sets which are lent on hire to ryots at nominal rates so as to enable them to pump water for their crops during periods of drought, or for well-sinking. The department also owns nine power-driven sugarcane crushing mills which are hired to the cultivators for crushing their sugarcane, and serve to demonstrate the advantages of power-crushing mills over bullock-driven appliances. There was a heavy demand from ryots during the period for the use of the crushing mills.

all of which were engaged during the crushing season. The manufacture of sugar by the open pan system with centrifugals has also been demonstrated to the public in several areas, and centrifugals are available for hire to the public for a nominal rent.

The department has given close attention to the development of the sugar industry in suitable areas of the presidency during the period under review and half a dozen factories have been established (some of them on co-operative lines) under the guidance of the department. There is still scope, however, for the setting up of additional sugar factories in the Madras Presidency, and schemes for new factories are under investigation.

North West Frontier Province.—It is anticipated that tube wells will provide a source of considerable load for the Malakand Hydro-Electric Scheme and investigations are proceeding.

United Provinces.—The system of subsidizing tube-well construction continues, but it has been decided to decrease the subsidy gradually, year by year, till it disappears completely in about seven years' time. Two hundred and eighty-seven large and 501 small tube-wells were completed during the last two years. Full scope has been given to private enterprise, but private firms have not so far been able to cheapen the cost.

The Nadrai pumping scheme has been completed, but the Gangan scheme has been abandoned owing to high capital outlay and operating expenses.

Projects have been framed for pumping water from the Gogra and Gumti rivers in the Fyzabad, Sultanpur and Partabgarh Districts.

57. *Ordinary Wells (paragraph 281).*

Baluchistan.—The wooden Persian wheels installed during 1933, have not proved satisfactory, as owing to their remaining idle during the winter months, heavy repairs were necessary. A further cause of failure has been the inability of the cultivators to work the wheels properly.

Delhi.—The action mentioned in the report for the years 1932 and 1933 continues.

North-West Frontier Province.—A. Wells in actual use are 12,400 in number and irrigate 44,266 acres.

B Wells in working order but not used are 668 in number and irrigate 4,674 acres.

C. Abandoned wells which are 780 in number and irrigate 177 acres.

United Provinces.—Boring was carried out in 3,630 wells, of which 2,757 were successful. Arrangements are being made to carry out borings in another 2,250 wells.

The number of societies for co-operative construction of wells increased from 20 to 27; a large number of credit and better living societies have been helping in the construction of masonry wells for irrigation.

58. *Establishment of close relations between Agricultural and Irrigation Departments (paragraph 283).*

Baluchistan.—The relations between the two departments are quite good; both the departments are working in co-operation in the interest of the zamindars.

Bengal.—Close touch already exists between the officers of the Agricultural and Irrigation Departments, specially in the conduct of crop cutting experiments in the areas commanded by the Damodar Canal so as to find out the extent of benefit derived by the cultivators by timely supply of silt laden canal water. Officers of the two departments met during the years under review to discuss the progress made and difficulties encountered, and chalked out the programme of joint works.

Bombay.—In the presidency proper there is a closer co-ordination between the officers of the Agricultural and Irrigation Departments. The officers of the Irrigation Department preside over several demonstrations and the reports of these meetings are submitted to the Heads of the Irrigation and Agricultural Departments. Several problems are also discussed in the Irrigation Conferences held under the Commissioner, Central Division, and in such conferences, the officers of both the Departments freely exchange their views. In Sind also the Agricultural and Irrigation Departments are working in close relationship to each other, especially in connection with problems relating to irrigation and water requirements of crops.

Central Provinces.—The action taken has been mentioned in previous reports. The combined class for officers and subordinates of the Irrigation and Agricultural Departments was held in October 1935 and was successful. It is proposed to hold the next class in 1937.

Delhi.—Opportunities are taken to discuss matters wherever desirable.

North-West Frontier Province.—Close relations continue. Various schemes have been examined by both Departments during this period, viz., sale of timber on canal banks, etc.

United Provinces.—Close touch continues to be maintained between the officers of the Agriculture and Irrigation Departments. They meet frequently to discuss the progress made and to prepare the future programme of joint work.

As a measure of economy, Irrigation Branch Officers could not be sent to the Government Agricultural Farm for training.

59 *Establishment of Irrigation Advisory Committees (paragraph 284).*

Bombay.—In the Presidency proper the Local Government have appointed a committee designated the "Deccan Irrigation Advisory Committee" consisting of the *Bagayat-dars* associations in the Deccan in order that a closer connection between Government and the irrigators may be established and to facilitate consideration of the latter's requirements and difficulties. The functions of this Committee are strictly advisory.

In Sind the Standing Committee on Lloyd Barrage outlived its usefulness and was abolished. A new Advisory Committee consisting of official and non-officials was appointed with the same functions as before, but with the modification that the committee should offer advice on any matter referred to it by Government or by the Commissioner in Sind instead of by the Standing Committee which has ceased to exist.

Delhi.—The Delhi Province is represented on the Advisory Committees of both the Western Jumna and Eastern Jumna canals.

United Provinces.—The seven canal advisory committees having worked satisfactorily, orders have been issued for the formation of similar committees in the remaining canal divisions. The committees are now to be on a canal divisional area basis. (Three were hitherto on a district area basis.)

60. *Research on Irrigation problems (paragraph 287).*

Baluchistan.—As stated in the previous reports the Local Administration has had no opportunity of carrying out any research works.

Bihar and Orissa.—The possibilities of tube well irrigation are being investigated.

Bombay.—In Sind research work on irrigation problems is being carried out by the Research and Development Division of the Irrigation Department. Recently, the Agricultural Department carried out an important experiment to determine the "duty" of irrigation water in rice cultivation on the Fuleli Canal system. An Irrigation Department officer was lent to the Agricultural Department to assist in this work. Special agricultural leaflets have been issued dealing with the irrigation of crops in the Barrage and non-Barrage tracts.

Madras.—Experiments started on irrigation problems in collaboration with the Engineering Department at Perundurai and Modachur in the Coimbatore district were concluded and further experiments were taken up at Kugalur and Chennasamudram in connexion with the Lower Bhavani Project. Experiments on duty of water started on the several Agricultural Research stations in co-operation with the Irrigation Department are in progress.

United Provinces.—The most important investigations of the Research Section were:—

- (a) Losses in watercourses and channels.
- (b) Lining on canals and watercourses.
- (c) Silt selective heads.

A considerable amount of work has been done on the determination of the Lacey silt factor by the mechanical analysis of silt, and correlating this factor with hydraulic conditions on channels held to be in régime.

61. *Preparation of drainage maps (paragraph 289).*

Baluchistan.—As already stated in the previous reports there is no necessity for this at present.

Bihar and Orissa.—Not yet taken up.

North-West Frontier Province.—Drainage requirements continue to be investigated, schemes are being prepared in order of urgency and are being carried out as funds become available.

United Provinces.—Surveys for two drains to decrease seepage and water logging along the Mat branch and to restrict flooding from tanks which overflow during the rains, have been completed, and work on these drains is in progress.

Preparation of drainage maps could not be undertaken for lack of funds.

62. *Irrigation in Sind (paragraphs 290-291).*

No remarks have been received from the local Government concerned.

63. *Irrigation in Bengal (paragraph 292).*

Bengal.—In the years under review the rainfall was insufficient and unequally distributed in the Burdwan district and therefore there was a great demand for canal water almost in every part of the district throughout the Irrigation season. The total area actually irrigated by the Damodar Canal in operation was approximately 127,511 acres, during the year 1935-36, as compared with 85,081 acres in the previous year. The increase in the irrigated areas is due to gradual progress of canals in operation. It has been ascertained by crop cutting experiments during 1934-35 in mauzas Suhari, Bolgona, Jhinguti, Channa and Dignagar in thanas Burdwan and Ausgram, that the outturn of the paddy had improved in comparison to that in the non-irrigated mauzas due to timely supply of silt laden water of the Damodar Canal. Mauza Raipur has been included in the crop cutting experiment during the year 1935-36.

The final report of the crop cutting experiment during 1935-36 is not yet out, but it has been gathered that the outturn has been very favourable. The mauzas and plots for experiment in every case were selected at random, and experiments on at least 160 plots in each mauza have been made to arrive at an idea of average outturn. Though none of these mauzas had the full advantage of irrigation from the beginning to the end of the irrigation season the outturn of paddy was good, whereas in non-irrigated areas the outturn was practically nil in both the years. In mauza Kaligram under long lease which received canal water from the beginning to the end of the irrigation season, the outturn was much better than in the mauzas under crop cutting experiments.

64. *Hydro-electric development (paragraph 295).*

Madras.—Please see the report for the year ending 31st December 1933.

Since then considerable extensions to the transmission and distribution systems under the Pykara Scheme have been made and supply of power extended to the Trichinopoly and Tanjore districts. Lift irrigation by electricity is becoming popular with agriculturists, the total number of pumping sets in service by the end of 1935 exceeding 170 aggregating 1,800 h. p.

The execution of another hydro-electric scheme at the Mettur dam is in progress and it is expected to commence operation about the middle of 1937.

North-West Frontier Province.—Malakand Hydro-Electric Scheme has been sanctioned. A separate Circle with Headquarters at Peshawar has been constituted. Work has started, and it is hoped that power will be available by October, 1937.

United Provinces.—A scheme for the development of hydro-electric power in the Mirzapur district, though investigated, has not been undertaken owing to insufficient demand for such power.

The Ganges hydro-electric scheme was expanded and the following works constructed during the last two years:—

- (1) Extension to Bahadradab and Bhola power stations, giving an additional generating capacity of 3,200 K. W.
- (2) Salawa Power Station, which is expected to be in commission by April 1936, giving an additional generating capacity of 3,000 K. W.
- (3) The Chitaura Power Station with an installed generating capacity of 3,000 K. W. is expected to be in commission by January 1937.
- (4) A 66 K. V. transmission line between Bhola and Sumera and a 37 K. V. line between Sumera and Chandausi to carry power to the southern portion of the grid area to meet demands in rural areas.
- (5) Electrification of the towns of Kasganj and Sikandara Rao.
- (6) Increase in the number of rural lines for private tube-wells from 88 to 209.

A project for the electrification of Fyzabad town has also recently been sanctioned.

All tube-wells of a large size in the hydro-electric grid area are provided with electric plant.

CHAPTER XI.—Communications and Marketing.

65. *Constitution of Road Boards (paragraph 305).*

Assam.—The programme is now held in abeyance *sine die* for paucity of funds.

Baluchistan.—As already stated in the previous reports a local Road Board is functioning. All works pertaining to communications other than those within Municipal or Cantonment limits are placed before the Board for approval.

United Provinces.—A Board of Traffic and Communications will be constituted shortly.

66. *Development of Subsidiary Communications (paragraphs 305—307).*

Baluchistan.—(a) Efforts are being concentrated on improving the main arteries and very considerable progress has been made throughout the Province. Certain fair weather roads have also been constructed.

(b) The construction of earth roads necessitated by the opening of canals in the Nasirabad Tahsil has been completed.

Bengal.—All the roads included in the first quinquennial programme with very few exceptions are complete. On the advice of the Provincial Board of Communications (formerly designated as the Provincial Road Board) and with the approval of the Government of India a 2nd quinquennial programme of road development schemes to be financed from the provincial share in the Road Account has been framed. Some of the road schemes included in this programme have already been taken up while preliminary works are being carried on for the preparation of detailed estimates for other schemes.

Bihar and Orissa.—The Government of India grant for rural reconstruction has enabled the Local Government to take active steps to develop and improve village communications.

Bombay.—As regards improvement of communications in the irrigated tracts in the Deccan, orders have been issued to the effect that one-third of the net proceeds of the cess levied on water rates under the provisions of section 95 of the Bombay Local Boards Act, 1923, shall be utilised towards the improvement of such communications. The Local Government appointed a Special Officer who, in collaboration with an officer appointed by the Railway Board, examined and reported on the communications required to develop the Nira Right and Left Bank Canal areas, specially in respect of new roads and improvements to existing roads and railway extensions. In regard to the new roads recommended by the two officers, detailed reports and estimates have been called for from the local officers concerned. As regards railway extensions in the Nira Valley area, the Great Indian Peninsular Railway have published the traffic survey report on the proposed Baramati-Pandharpur Railway. The views of the Local Government on the survey report will be communicated to the Railway Administration on receipt of the reports called for from the local officers. No decision has yet been reached by the Railway Board in this matter.

The question of constructing roads in Sind necessitated by the construction of the Barrage was investigated by a Special Officer appointed by the Government of India for the purpose. The Government of India forwarded to this Government a copy of the Special Officer's report for remarks. The remarks of the Government of Bombay have been communicated to the Government of India. But in accordance with one of the recommendations of the Special Officer this Government appointed, towards the end of 1935, a Special Road Engineer in connection with road development in Sind.

North-West Frontier Province.—A large number of new roads have been constructed and old ones improved from road development funds.

United Provinces.—Lack of funds did not again permit of the development of subsidiary communications. But some 36 miles of local roads in the Garhwal, Cawnpore and Jaunpur districts were taken over for maintenance by the Public Works Department.

67. Establishment of Regulated Markets (paragraphs 329—378)

Bihar and Orissa.—So far it has not been possible to do anything in this connection. The results of the marketing survey, which is being carried out by Provincial Marketing Officers will indicate what steps should be taken.

Bombay.—In the Presidency proper the regulated cotton market at Dhulia continues to be popular. In 1935, a regulated cotton market was established at Amalner, this market being the second of its kind in the North Central Division. Preliminary work in connection with starting another regulated cotton market at Dandrucha in the West Khandesh District was done. Efforts are being made to bring into force the Cotton Markets Act. The establishment of cotton markets at Bailhongal in the Belgaum District and at Bijapur.

In Sind the question of establishment of regulated cotton market is under consideration by the Sind Cotton Committee and references have been made to District Local Boards, Municipalities, etc., in the main cotton growing tracts with the object of obtaining their support to the establishment of experimental regulated cotton markets.

Burma.—No action has been taken. The examination of the question of establishing regulated markets will come within the purview of the Marketing Section of the Agricultural Department of this Province.

Central Provinces.—The Berar Cotton Markets Rules were further revised. A regulated cotton market was established at Dori buruk in Dindori taluq of the Yeotmal district on the 4th November 1935, under the Berar Cotton and Grain Markets Law. Regulated cotton markets under the Central Provinces Cotton Market Act, have been established at Warora and Chanda in the Chanda district.

To cope with the various mal-practices prevailing in the grain markets in the Central Provinces, an Agricultural Produce Market Act has been passed for the establishment of regulated markets for the sale of agricultural produce other than cotton in the Central Provinces, particularly rice, wheat and oil seed. The markets regulated by this measure will be under the management of committees, half of which will consist of representatives of the growers. Rules under this Act are being framed.

The post of Provincial Marketing Officer, which had been held in abeyance as a measure of retrenchment, was revived in August 1934. The Imperial Council of Agricultural Research has offered this Government an annual grant not exceeding Rs. 20,000 for a period of five years to appoint three Assistant Marketing Officers to work under the Provincial Marketing Officer each on a specific group of commodities. It is expected that this would result in an appreciable improvement in the marketing facilities for various kinds of agricultural produce of the province.

Madras.—Rules under section 18 of the Madras Commercial Corps Markets Act (Act XX of 1933) have been issued. The Tiruppur Municipality has been declared a notified area under the Act with effect from January 1936.

North-West Frontier Province.—No action has yet been taken for the establishment of regulated markets, but in regard to fruit the Tarnab Farm Agricultural Station markets fruit to the value of about Rs. 30,000 every year and valuable information is being obtained in regard to marketing problems.

United Provinces.—No action has yet been taken for the establishment of regulated markets, but a marketing survey is being conducted with the help of a grant received from the Imperial Council of Agricultural Research.

68 Efforts to secure improved quality from producers with special reference to encouragement of Co-operative Sale Societies (paragraphs 340—342).

Bombay.—In the North Central Division, efforts are made, wherever possible, to start such sale societies. In the Southern Division, all possible assistance is given to the cotton sale societies in grading and sale of cotton. There is the closest possible co-operation between these societies and the Agricultural Department. The other sale societies are the Chillies Sale Society at Byadgi and the Tobacco Sale Society at Nipani and they also are receiving attention.

In Sind, action on the lines suggested is taken whenever possible.

Central Provinces.—There is no regular co-operative sale society in the province. But the Agricultural Department pooled verum cotton grown under its supervision through the co-operative taluq agricultural associations in Berar. Efforts were made to get the two *adat* shops at Narsinghpur and Piparia to start work but there was not sufficient response from the people. One agricultural association did some business in supplying pure potato seed. Efforts are being made to take advantage of the experience gained of the "pool system", started by the Agricultural Department for organizing co-operative cotton sale societies in the district of Nimar in the Central Provinces. The number of associations increased from 34 to 37, and that of seed unions from 10 to 13 while that of *adat* shops decreased from 10 to 9.

Madras.—Please see remarks made in the report for the years 1932 and 1933.

The Tiruppur Society, in the Coimbatore district, is carrying on the 5-year plan of multiplication of CO₂ cotton seeds. The society purchases pure CO₂ cotton seeds from the Agricultural department and supplies them to the ryots free of cost in the first instance on condition that the cotton raised with the seeds is taken to the society for ginning and sale, at which time cost of the seeds supplied is recovered from the ryots. During 1934, the society sold 7,039 bags of cotton seeds. The scheme has been working for three years now and it is expected that, at the end of five years, the area brought under cultivation will yield 100,000 maunds of pure seed. The business manager of the society is a member of the Agricultural department and is assisted by the agricultural demonstrators.

North-West Frontier Province.—For the last two years the Co-operative Societies have been encouraged to sell barley direct to the Army Commission Agents, Messrs. Owen Roberts. This has resulted in a premium of about 4 annas per maund being obtained and valuable information has been acquired regarding the necessity of proper cleaning and grading.

Punjab.—Disloyalty on the part of the members and dishonesty on the part of the staff, are the two great obstacles in the way of commission shops, but they show some improvement.

United Provinces.—Marketing Officers have been appointed and surveys are being carried out by them.

The co-operative society at Bilgram (Hardoi) has maintained a uniform supply of CO₂ cotton.

A society at Royorkee, which supplies improved seeds to members, has been working successfully.

Co-operative marketing of sugarcane has been taken up in five districts. The number of primary cane supply societies is 278. Besides, there are five central societies serving as intermediaries between cane growers and factories.

There is a vacuum pan co-operative sugar factory at Biswan (Sitapur) which obtains supplies of sugarcane direct from members.

69. Auction Sales by Agricultural Departments (paragraph 343).

Bombay.—In the North Central Division, the 'Banilla' cotton grown under departmental work is sold by auction wherever possible. In the Southern Division, auction sales of cotton are arranged through the co-operative cotton sale societies where cotton graded by the departmental officers is sold in different lots. During the last two years, 12,792 dokras of Jayawant cotton and 37,672 dokras of upland cotton were graded and sold by the sale societies by open auction.

In Sind no such sales have been organised by the Agricultural Department, but much assistance has been rendered to large growers by putting them in direct touch with buyers and markets.

United Provinces.—No auction sales have been resorted to.

70. Experiments with Containers (paragraph 345).

Bihar and Orissa.—In the Horticultural Section experiments have been made to find out a suitable yet inexpensive container for the transport of mangoes of Bihar to outside markets.

Central Provinces.—No action has yet been taken.

Madras.—The scheme for the establishment of a research station to carry out research on fruit sanctioned by the Imperial Council of Agricultural Research has been started at a research station opened in Anantapur in the Cuddapah district.

North-West Frontier Province.—The Agricultural Department by marketing its own fruit has contributed considerably to the standardization of containers.

United Provinces.—No experiments with containers could be carried out.

71. Market Surveys (paragraph 347).

Assam.—A Marketing Officer and two Assistant Marketing Officers have been appointed with the financial assistance of the Imperial Council of Agricultural Research. They have commenced marketing surveys for a number of agricultural commodities and are working under the guidance of the Agricultural Marketing Adviser to the Government of India under the direct control of the Director of Agriculture.

Bihar and Orissa.—The Provincial Marketing Scheme came into operation in March 1935. As a preliminary to any scheme for the proper development of agricultural marketing in India, the Provincial Marketing Staff in collaboration with the Central Marketing Staff is at present engaged in comprehensive surveys of the production and the marketing of different commodities throughout the province.

Bombay.—In the Presidency proper, a survey on the marketing of groundnut was carried out in Khandesh. The Local Government realising the importance of the subject appointed a Committee consisting of officials and non-officials to examine and report on the fruit and vegetable marketing problems in Bombay City. This Committee published a report on the conditions under which fruits and vegetables are marketed at present, giving useful recommendations for the improvement of the same. The Committee's report is under the consideration of Government.

In Sind this work is being undertaken by the special marketing staff, appointed and financed by the Government of India in connection with the improvement of the marketing of agricultural produce in India. Three Assistant Marketing Officers are conducting marketing surveys on cereals, oil-seeds and fruit and live-stock and live-stock products, respectively.

Burma.—Preliminary surveys have been completed and submitted to the Marketing Adviser to the Government of India as shown below:—

- (1) Marketing of Crops in Burma—An introductory note.
- (2) Marketing of Tobacco.
- (3) Marketing of Groundnut
- (4) Marketing of Linseed.
- (5) Marketing of Milk
- (6) Marketing of Plantains.
- (7) Marketing of Apples and Pears.

In addition to these marketing surveys the following general crop surveys have been completed and have been either published or are in process of publication:—

- (1) Burma Cotton and its Improvement.
- (2) Sugarcane in Burma.
- (3) The Mangosteen in Burma
- (4) Burma Fruits and their cultivation.

Central Provinces.—This work is now being done by the marketing staff aided by the grant from the Imperial Council of Agricultural Research and surveys of the marketing of agricultural produce, including fruits and animal husbandry products, are in hand.

Madras.—As a preliminary step to an intensive programme to develop the marketing facilities for crops and animal husbandry products, the appointment of a Provincial Marketing Officer and the establishment of a Provincial Marketing Board were sanctioned. Both commenced to function from September 1934. The Provincial Marketing Officer was appointed as ex-officio Secretary to the Marketing Board. Three Assistant Marketing Officers were appointed to assist the Provincial Marketing Officer out of the funds provided by the Imperial Council of Agricultural Research.

North-West Frontier Province.—This work is being carried out by the Marketing Officers recently appointed.

Punjab.—Towards the end of March, 1935, effect was given to a 5 year Marketing Scheme which is being financed jointly by the Punjab Government and by the Imperial Council of Agricultural Research as part of an All-India scheme. A Marketing Officer assisted by 3 Assistant Marketing Officers is in charge. Marketing surveys of some of the products selected for the first year's work have been completed and others are in progress.

United Provinces.—Marketing surveys are being undertaken in the province by the marketing staff which has been appointed with the help of funds given by the Imperial Council of Agricultural Research. The lines on which such surveys are being carried out have been laid down by the Imperial Council of Agricultural Research.

72. Appointment of Expert Marketing officers (paragraph 348).

Assam.—Remarks under item 71 may be seen.

Bihar and Orissa.—Remarks under item 71 may be seen.

Bombay.—The Live-stock Expert to Government has been entrusted with the work of Marketing Officer in addition to his own duties. He is working under the instructions of the Agricultural Marketing Adviser to the Government of India. Four officers of provincial rank have been appointed under him. Each of them is entrusted with a separate problem of investigations. Marketing surveys are now being conducted by these officers for dairy products, plantation crops, oil seeds and staple crops.

Burma.—A Marketing section consisting of one Provincial Marketing Officer and three Assistant Marketing Officers has been created in the Agricultural Department of this Province with effect from 1st February 1935 and investigations into the marketing conditions of the main crops of this Province have been undertaken by this section in collaboration with the Marketing Adviser to the Government of India.

Central Provinces.—Three assistant marketing officers have been appointed under the scheme inaugurated by the Government of India. The post of the Deputy Director of Agriculture, Economics and Marketing which was held in abeyance has been revived and an officer of the Indian Agricultural Service is now doing the work..

Punjab.—See remarks against item 71.

United Provinces.—A Provincial Marketing Officer has been appointed.

CHAPTER XII.—The Finance of Agriculture.

73. Limitation on period of usufructuary Mortgages (paragraph 353).

Bihar and Orissa.—The Government of Bihar and Orissa do not consider that legislation to limit the period of usufructuary mortgages is suitable for all parts of this province. The policy which the local Government have followed in Bihar is to make transfers of land easier and safer by reducing the amount of the transfer fee payable to a landlord, by enabling the transferee to get a secure title on payment of the transfer fee, and by measures to protect both transferor and transferee from the harassment to which they were liable under the old system. This new legislation is clearly incompatible with any proposal to limit the period for which an usufructuary mortgage can be given and the local Government do not consider that such legislation will serve any useful purpose in Bihar.

In the more backward tracts of the province the position is different and the Chota Nagpur Tenancy Act already provides that no usufructuary mortgage shall be for a period exceeding five years while in the greater part of the Santal Parganas the tenants have no right to mortgage their land at all. In the year 1935 the local Government introduced a Bill to deal with the special case of the Santals in certain parts of the Bhagalpur division lying outside the Santal Parganas. It was recognised that restrictions on alienation of land by the aboriginals in this area were necessary and the Bill, which was passed into law the same year, prohibits all forms of alienation of land of aboriginal tenants, except an usufructuary mortgage for a period not exceeding 7 years by an aboriginal to another aboriginal. Subletting is permitted, but only to another aboriginal and for a period not exceeding five years.

United Provinces.—The United Provinces Agriculturists' Relief Act deals with limitation of the period of usufructuary mortgages of agricultural and grove land. The United Provinces Encumbered Estates Act provides *inter alia* for the liquidation of agriculturists' debt in certain circumstances by granting a usufructuary mortgage of not more than three quarters of the debtor's landed property for a period of not more than 20 years to any person agreeing to pay off the debt.

74. Removal of restriction on operation of Punjab Redemption of Mortgages Act (paragraph 354).

No remarks have been received from the local Government concerned.

75. Enactment of Legislation in regard to redemption of Mortgages in provinces other than the Punjab (paragraph 354).

Bihar and Orissa.—Remarks under item 73 may be seen.

United Provinces.—The United Provinces Agriculturists Relief Act, 1934, provides for redemption of mortgages by agriculturists on application to the Civil Court.

76. Desirability of extension of Principle of Statutory Restriction on Alienation of Land (paragraph 355).

Bihar and Orissa.—Remarks under item No. 73 may be seen.

United Provinces.—The Land Alienation Bill has not yet been introduced in the Legislative Council. It has been deferred till experience has been gained of the working of Debt Acts passed by the Council during 1934-35.

77. *Enquiry into Expropriation of Hereditary class (paragraph 353).*

United Provinces.—It was not found possible to undertake an enquiry on the subject.

78. *Removal of difficulties in the way of Landlords investing Capital in their Lands (paragraph 358).*

Madras.—Please see the report for the year ending 31st December 1933.

The provisions in the Estate Land Act (Amendment) Bill referred to in that report have since become law.

United Provinces.—Landlords are free to invest capital in their lands; there are no particular difficulties in their way.

79. *Working of Land Improvement Loans Act and Agriculturists' Loans Act (paragraphs 359 and 362).*

Coorg.—A statement showing loans granted, recovered or pending for recovery under Land Improvement Loans and Agriculturists' Loans Acts during the years 1934-35 is given below —

	Loan granted.	Recovered.	Pending.
	Rs.	Rs.	Rs.
Land Improvement Loans . . .	26,870	8,356	1,60,683
Agriculturists' Loan . . .	22,240	11,120	1,21,415

Delhi.—Attention is invited to the remarks in the report for the year 1931.

During the years under report, Rs. 6,200 were advanced under the Land Improvement Act XIX of 1883 for the construction and repair of wells, and Rs. 6,515 under the Agricultural Loans Act XII of 1884 for the purchase of seeds and bullocks.

Madras.—Loans to the value of Rs. 14,200 were sanctioned during the period to ryots under the Land Improvements Loans Act for the installation of pumping plants. Such loans were granted only in cases where there were reasonable prospects of an increased area being brought under cultivation, and a correspondingly increased return to the cultivator.

North-West Frontier Province.—The total amount paid out as taccavi under both the Acts, viz., Act XIX of 1883 and Act XII of 1884, during the years 1934 and 1935 was Rs. 1,59,757. The outstanding at the beginning of this period stood at Rs. 15,09,038. During the period under review Rs. 2,70,725 were recovered. The balance to be recovered at the end of 1935 was Rs. 12,38,315 and half of this sum is due from Peshawar District alone. It has to be remembered that the figure for recoverable taccavi in Peshawar stood at over 10 lakhs in 1930 and has now been reduced by about half. The difficulty in making recoveries is due partly to the fall in the prices of agricultural produce, but still more to the accumulation of arrears during the disturbances which took place between 1930 and 1932, when immense difficulty was experienced in collecting land revenue, water rates and taccavi.

The working of these Acts seems to be reasonably satisfactory in all Districts except Peshawar, where taccavi is often not used for the purpose for which it has been granted. An experiment is now being made with a scheme by which taccavi is paid to the Agricultural Department, which arranges for the supply to the agriculturists who has taken the loan, of whatever he requires, for instance seed, fruit trees, ploughs or sugarcane presses.

The tendency now is severely to restrict loans under Act XIX of 1883 and to confine the use of Act XII of 1884 to cases of genuine distress resulting from crop failures and other calamities.

One quarter of the budget allotment for taccavi loans under Act XII has been placed at the disposal of the Agricultural Department. All loans are made in kind and consist mainly of seed, agricultural implements, manure and insecticides. The policy is to confine loans to small amounts so that the benefit is as wide as possible.

United Provinces.—The Agriculturists Loans (Amendment) Act which came into force from January 19, 1935 provides for the grant of taccavi advances for the repayment of existing debts and the purchase of rights in agricultural land.

Advances for the construction of tube-wells amounted to Rs. 42,887 in 1934 and Rs. 53,886 in 1935. Advances were also made for the purchase of bulls, cows and fertilizers and of sugarcane seed to the extent of 2½ lakhs.

80. *Working of Usurious Loans Act (paragraphs 364-365).*

Central Provinces.—The Usurious Loans Act, 1918, has been amended by the Usurious Loans (C. P. Amendment) Act, 1934 (XI of 1934), and the latest report on the working of the Act shows that it has greatly facilitated the exercise of the discretion vested in the courts. In order to invoke the aid of the Act, it is no longer necessary to

show that the interest claimed is excessive and also that the transaction was substantially unfair; the statutory duty of re-opening the old transactions and revising the interest has now been laid on the court when one of these conditions is fulfilled. The other important provision of the Amendment Act specifies the rates of interest, which will ordinarily be presumed by the courts to be excessive. The Usurious Loans Amendment Act has considerably facilitated the work of the courts and the district reports show that the provisions of the Act were applied in all suitable cases. It has also had a salutary effect on creditors who now not infrequently ask, in court, for interest at a lower rate than that stipulated in the transaction on which they sue.

Madras.—It has been made clear in the Madras Debtors' Protection (Amendment) Act (Act IV of 1936), that the provisions in the Act should not in any way fetter the discretion of the courts to enquire into the fairness of transactions under sections 3 and 4 of the Usurious Loans Act. In a report on agricultural indebtedness in the Madras Presidency recently prepared by a Special Officer, it has been suggested that the Usurious Loans Act may be so amended as to disallow compound rates of interests on loans to agriculturists and that the High Court should issue a direction to all civil courts to use the Usurious Loans Act with greater regularity and precision. These recommendations, as well as the recommendation that the ancient and equitable rule of Hindu Law, *viz.*, "Damdupat" should be introduced in this Province, have been referred to the Hon'ble the Judges of the High Court for remarks. The Board of Revenue has stated that the rule of "Damdupat" is unnecessary in view of section 16 of Madras Debt Conciliation Act.

United Provinces.—The Usurious Loans (Amendment) Act in its application to the United Provinces provides that interest beyond certain specified rates shall normally be deemed excessive and, concurrently, that interest below certain specified rates shall not be deemed excessive for the purposes of the Act.

81. Examination of case for Money Lenders Act (paragraph 366).

Assam.—The Assam Legislative Council passed the Assam Money Lenders' Act which became Assam Act No. IV of 1934. The Act was brought into force with effect from the 1st April 1935.

Central Provinces.—The Central Provinces Money-lenders Act, 1934 (XIII of 1934), has been passed and brought into force from the 1st April 1935.

Madras.—The Madras Debtors' Protection Act which is intended to protect cases of small debtors has become law. This Act applies to cases of loans below Rs. 500 and provides that where the rate of interest (simple) exceeds 9 per cent. in the case of secured loans and 15 per cent. in the case of unsecured loans, the courts shall, in any proceeding before them in respect of loans advanced after the coming into effect of the Acts, presume until the contrary is proved that the rate of interest is excessive. This presumption is also made specifically applicable to cases of compound interest. Rules under the Act have also been issued.

United Provinces.—The Agriculturists Relief Act, 1934, empowers the Local Government to fix limits to the rate of interest chargeable to loans taken by agriculturists. It also makes it incumbent on a creditor to maintain a regular and correct account and to supply annually a copy thereof to each agriculturist debtor.

82. Examination of case for Rural Insolvency Act (paragraph 367).

Assam.—The question of a Debt Conciliation Act for Assam is now under the consideration of the Legislative Council.

Central Provinces.—The matter has been considered by Government. Amendment of the Usurious Loans, the Money-lenders Act, and establishment of debt conciliation boards and land mortgage banks are some of the important measures which this Government has taken for the relief of rural indebtedness. It has, therefore, been decided to await the results of these measures before proceeding further with any radical measure for dealing with rural insolvency.

Madras.—The Special Officer on agricultural indebtedness in his report, has stated as follows:—

"There will still remain a class of debtors whose assets and earning capacity cannot possibly serve to clear off even their conciliated debts.....Their only chance of being saved is for them to surrender all their assets to their creditors and to become adjudged as insolvents. I venture to suggest that the application for insolvency on behalf of such debtors be made by the Debt Conciliation Boards themselves. I suggest that in such cases, the limit of Rs. 500 found in section 9 (1) of Provincial Insolvency Act (V of 1920) be considerably reduced and the courts having jurisdiction be empowered to deal with the debtors estate in a summary manner, even though the value of the property may exceed Rs. 500."

The High Court have been asked to state whether legislation can be introduced and, if so, on what lines, and their reply is awaited.

It may also be stated in this connection that a Bill for the establishment of Debt Conciliation Boards in the Presidency was recently passed by the Madras Legislative Council and it is now awaiting the Governor-General's assent. This Act lays down the minimum amount of debt for purposes of the Act as Rs. 100 while no maximum is fixed, and provides for the establishment of a Debt Conciliation Board for any district or part of a district. The duty of the Debt Conciliation Boards will be reduced to writing the amicable settlement which may be arrived at between creditors and debtors who apply to them, and if, in the opinion of the Board, any creditor refuses to accept a fair offer made by a debtor, it shall issue a certificate to that effect. Such a certificate debars a creditor from getting costs and more than six per cent. simple interest from the date of such certificate on his loan. The Debt Conciliation Act also fixes the maximum amount allowable in satisfaction of a debt.

United Provinces.—A Rural Insolvency Act is not considered necessary in view of the Agriculturists Relief Act.

88. Conciliation Bodies (paragraph 367).

Central Provinces.—The debt conciliation boards at Khurai and Seoni referred to in the preceding report completed their work during the period. The board at Khurai conciliated debts aggregating Rs. 16.17 lakhs for Rs. 8.37 lakhs, resulting in a remission of 48.3 per cent. of the demand. Certificates under section 15 (1) of the Act were issued for debts aggregating Rs. 12.96 lakhs. The effect of these certificates is that in civil suits regarding such debts creditors will not be allowed costs or interest in excess of simple interest at six per cent. from the date of the certificate. The board at Seoni conciliated debts aggregating Rs. 44.40 lakhs for Rs. 25.75 lakhs, resulting in a remission of 42 per cent. of the demand. Certificates under section 15 (1) were issued for debts aggregating to Rs. 5.99 lakhs.

Sixteen more boards were established during the period under report. Five of these have been financed out of the grant received from the Government of India for rural development and the rest from provincial revenues. Up to the end of December 1935 debts amounting to Rs. 1,06.02 lakhs were settled by these boards for Rs. 61.95 lakhs, resulting in a remission of 41 per cent. of the demand. Certificates under section 15 (1) were issued for debts, aggregating Rs. 7.60 lakhs.

United Provinces.—The formation of conciliation boards is not considered necessary in view of the passing of the United Provinces Encumbered Estates Act and the United Provinces Agriculturists' Relief Act.

81. Appointment of Official Receivers (paragraph 387).

United Provinces.—No particular difficulty is experienced in connexion with the appointment of receivers.

CHAPTER XIII—Co-operation.

85. Enquiry into working of Co-operative Movement in provinces other than the Central Provinces, the United Provinces, Madras and Burma (paragraph 373).

Bengal.—Government do not propose to constitute a committee to enquire into the movement and a non-official resolution to that effect was rejected by the Legislative Council during the session in July-August 1935. They have before them, however, the report of Mr. M. L. Darling, C.I.E., I.C.S., made early in 1935 after an inspection of the movement in the Province. On this report they have already decided upon a considerable strengthening of the departmental staff and are considering his other recommendations.

Bihar and Orissa.—A committee on co-operation was appointed in 1931-32. Its recommendations are being given effect to as far as funds and circumstances permit.

Coorg.—The report of the officer obtained from Madras is before the Local Government awaiting final orders on some of the recommendations. Some of the recommendations have been given effect to.

Delhi.—The recommendations of the Central Area Banking Enquiry Committee continue to be given effect to as far as possible.

North-West Frontier Province.—The number of Societies which stood at 382 on 31st July 1933 had risen to 529 by 31st July 1935, the membership from 12,072 to 19,659 and the working capital from 15,86,545 to 21,05,622. 147 new societies were registered during the period under report.

86. Building up of efficient Co-operative Staff (paragraph 374).

Bengal.—The superior staff of the department was increased during the years under report by the appointment of one Deputy Registrar, mainly for supervision of the Land Mortgage Banks.

Bihar and Orissa.—A reorganisation scheme of the Co-operative Department is being given effect to from April 1936. This provides a staff of Inspectors of Co-operative Societies who will form a link between Assistant Registrars and primary societies. Their appointment should ensure better supervision of primary societies.

Bombay.—Continued financial stringency prevented an increase in the staff to the required strength. However, there have been some additions recently, with the creation of two special posts of Assistant Registrars—one for the Land Mortgage Banks and the other for co-operative training and education. The cost on account of the latter is met by the Government of India. There have also been some additions to the audit staff of the Co-operative Department by the creation of two posts of Sub-auditors.

Central Provinces.—Training classes for the staff continued to be held, and they are required to pass examinations. Under the new rules no person can be employed by a co-operative society unless he gets the certificate for having undergone the prescribed training.

Coorg.—Two more Inspectors have been added to the executive staff bringing the total to 6 Inspectors and one clerk to the clerical staff bringing the total to three in giving effect to one of the recommendations referred to in the item 85.

Madras.—During 1934, Government ordered the opening of the Central Co-operative Institute at Madras to train candidates for a year for employment in Government service and of two peripatetic classes, one in the Telugu districts and another in the Tamil districts for training candidates for five months for employment in co-operative institutions. The Central Co-operative Institute is now in its second session. No peripatetic class was conducted in the Telugu districts as non-official co-operators were unwilling to run it. Two courses were held in the Tamil districts one at Vellore and the other at Tanjore. No classes have been held subsequently pending sanction of the comprehensive scheme of training of the official and non-official staff and of the panchaytdars which is under the consideration of the Government.

Punjab.—The staff as a whole is well trained as the result of the systematic training given during the last 20 years. The teaching of members, which is much more difficult, leaves a good deal to be desired, but is being systematically undertaken with the help of a special grant made by the Government of India in 1935. The grant which is to be spread over five years, has enabled the Local Government to appoint an Educational Assistant Registrar (a post which has been needed for some time) and Additional Educational Inspectors and Assistants and this has led to a considerable extension of classes for Secretaries, committee members and other members of primary societies.

United Provinces.—The co-operative staff is given adequate training, and short refresher courses are held from time to time to keep up their knowledge. The education of members is also attended to; it is proposed shortly to hold special classes for the training of *panchics* and member secretaries of village societies.

87. Supervising Unions (paragraph 375).

Bihar and Orissa.—The recommendation of the Bihar and Orissa Committee on co-operation for separating the functions of banking and supervision or development, has not been given effect to for want of funds.

Bombay.—In this Presidency the system of Supervising Unions was introduced in 1924. For some years past it was noticed that the Unions were not working satisfactorily and that the condition of societies in their charge was deteriorating. A Committee was appointed in 1933 to examine the system of supervision over societies in details and to make recommendations for its improvement. The Committee found that the unsatisfactory working of the Unions was due to the defects in their constitution and staff. On the recommendations of the Committee Government have issued orders for improving the constitution of the Unions and the employment of a better qualified and better paid staff under them. The Unions have been given wider powers to enforce their suggestions and recommendations on the societies. Under the orders now issued the Unions control the appointment of secretaries of the affiliated societies and can suspend, with the approval of the District Boards of Supervising Unions, a committee of management of a society or a member of such a committee for a maximum period of 12 months. Improved scales of pay have been fixed for the supervisors under the Unions and provision has been made for their leave salary and contributory provident fund. To ensure proper working and management of Supervising Unions the creation of District Board of Supervising Unions in each district has been sanctioned. The District Boards are to have definite constitution and powers. The entire control in the matter of recruitment, promotion and dismissal of the supervisors under the Supervising Unions is vested in the District Boards. The Boards have been given power of suspending, with the approval of the Registrar, the managing committees of Supervising Unions for a maximum period of six months in cases in which their orders are disregarded by such committees in spite of clear warnings.

At present some of the societies are supervised by the Banking Union, Ahmedabad, and some of the Taluka Development Associations. On the recommendations of the Committee Government have directed that supervision by these agencies should cease and that efforts should be made to organise Supervising Unions for the societies now in their charge.

The entire cost of Supervising Unions is financed from the following sources:—

- (a) Supervision fee paid by the affiliated societies.
- (b) Contribution by the Central Banks on their loan transactions with the societies.
- (c) Grants from Government out of the audit fee receipts.

Central Provinces.—The Institutes continued to control the field staff working in their areas.

Coorg.—As reported previously (1932-33 Report) a Supervision Board of five constituted from among the Directors of the Central Bank does the supervision.

Madras.—Due to contraction of loan transactions and the consequent fall in their profits, central banks were advised to reduce their expenditure. One of the methods suggested was a reduction in the number of unions by the liquidation of bad unions and division of the societies among the surviving good unions. Accordingly registration of 18 unions was cancelled in 1933-34 and of 59 in 1934-35. There were 301 supervising unions on 30th June 1935. The present working of the local supervising unions cannot in all cases be said to be satisfactory. But they cannot be replaced by any suitable organization with the same local knowledge and influence over societies. Local unions therefore continue to do the work of supervision, but their activities are co-ordinated and controlled by the central banks. In consequence of this arrangement, district federations were found to be superfluous and out of the eight district federations referred to in the previous report six have been since liquidated; the remaining two have suspended their activities and handed over their functions to the central banks in the area.

United Provinces.—The provincial Co-operative Union, which is in existence for over seven years, has 55 out of 71 central co-operative banks affiliated to it. The number of supervisors employed by the Union is 211. It received grants amounting to Rs. 1,46,415 from Government in the last two years.

88. Policy to be followed in selecting Registrars of Co-operative Societies (paragraph 376).

Bengal.—A post of Deputy Registrar has been created provisionally for four years and a junior I.C.S. officer has been appointed thereto. It is intended that he shall be succeeded by another junior I.C.S. officer after a period sufficiently long for him to have thoroughly grasped the work of the department.

Central Provinces.—The policy suggested in the report is being followed as far as possible.

United Provinces.—An Indian Civil Service officer has been appointed as full time Registrar since August 1934. There is no officer under training to succeed him, one post of Deputy Registrar being in abeyance.

89. Appointment of a whole-time Registrar in the Central Provinces (paragraph 376).

Central Provinces.—The present arrangement of the dual charge of the Registrar, Co-operative Societies and the Director of Industries, which has been carried on since the year 1918, is still continued. The question of separating the appointment has had to be kept pending an improvement in the numerical position.

90. Training of Co-operative Staff (paragraph 377).

Assam.—Four Co-operative Inspectors have been deputed to the Punjab to learn the Punjab system of co-operative training.

Bengal.—With the assistance of a grant from the Government of India the local Government have under consideration a detailed scheme of training on the lines of that adopted in the Punjab in which is contemplated the incorporation of an examination for both inspectors and auditors by a suitable standard.

Bihar and Orissa.—A grant of Rs. 1,23,000 has been sanctioned by the Government of India for education of the co-operative staff and the members of the co-operative societies in this province. Government have tentatively approved a scheme of training and education and a beginning has been made by opening a class for training Inspectors with effect from the 14th November 1935. The question of the permanent location of the training institute is under the consideration of the local Government.

Bombay.—A scheme prescribing suitable training and syllabus as a substitute for the G.D.C.A. Examination is under consideration of the Local Government.

Besides, a separate scheme known as the "Co-operative Training and Education Scheme" has been recently launched with the assistance of a grant placed at the disposal of this Province by the Government of India. Accordingly, one Assistant Registrar and six Assistants have been appointed and it is proposed to train the departmental and other staff through a course lasting for about four months.

Central Provinces.—A training class of candidates selected for the posts of auditors was held during the year 1934-35. After the class was over the candidates were examined in four subjects, viz., Theory, Law, Departmental circulars and Accounts, with the result that out of twelve candidates appearing seven passed in all the subjects. With the aid of the Government of India grant fresh measures are to be adopted for training the staff and accordingly one Educational Inspector and three Assistant Educational Inspectors of the department were sent to the Punjab for training in November 1935.

Coorg.—A scheme for training the co-operative staff and educating the members of the Co-operative Societies at a cost of Rs. 20,000 spread over 3 years has just been sanctioned by the Central Government.

N.-W. F. P.—Two Inspectors and two Inspector candidates attended the Gurdaspur Class in 1934, and one Inspector and two Inspector candidates in 1935. Three Sub-Inspector candidates in 1934 also joined the Sub-Inspector Class at Gujar Khan, and two Sub-Inspector candidates in 1935 were sent to Sub-Inspector Class at Lala Musa. Joint Refresher Courses were held at Peshawar. Officers of other Departments were invited to deliver lectures on their particular subjects and all members attending the course were taken to the Agricultural Farm at Tarnab to improve their knowledge of the crops and methods advocated at the Farm.

Secretaries Classes were also held. The value of these classes is very great and arrangements are being made to extend them to members of Committees as well as Secretaries. Apart from these special classes, the staff has continued to impart teaching to members of societies during their visit of inspections and have stressed the importance of thrift, the avoidance of extravagance and dangers of the habit of borrowing; attention has also been drawn to all other methods of improving their income and standard of living. The teaching given by the Co-operative staff is not confined to members of societies but is extended to all whose ears they can reach in the village which they visit. Teaching and propaganda are also arranged at Fairs and other rural gatherings. Sixteen lectures have been supplied for Broadcasting from the Peshawar Station during the period under report; and this is perhaps the beginning of the dissemination of reaching over an even wider area than before.

Punjab.—See remarks against item 86.

United Provinces.—Inspectors, auditors and supervisors receive training for a year and have to pass an examination before appointment.

91. *Government Aid to Specialised Forms of Co-operative activity (paragraph 378).*

Bengal.—A substantial recurring grant was made by the local Government for clerical work in societies amongst backward classes. An annual grant of Rs. 6,500 was also made to the Bengal Co-operative Organisation Society, Limited, for propaganda and publicity work as well as for publishing two co-operative periodicals, one in English and the other in Bengali. A special staff of 10 inspectors and 10 supervisors is maintained by the local Government for the organisation and supervision of irrigation societies. Further, a total grant of Rs. 33,000 in 1934 and Rs. 76,000 in 1935 was made by the Government of India for development of handloom industry organised on co-operative basis in this Province. Process-serving machinery, improved looms, dyeing appliances and expert staff were provided with the help of the grant to the co-operative industrial unions and the Provincial Industrial Society.

Bihar and Orissa.—With the introduction of the scheme for the development of the handloom industry in Bihar and Orissa approved by the Government of India, a grant of about Rs. 6,000 has been placed at the disposal of the Co-operative Department for organising weavers' co-operative societies. Accordingly one organiser and 3 supervisors for the organisation of weavers' co-operative societies have already been appointed. The number of the supervisors will increase to 8 in course of time. A few weavers' co-operative societies have already been organised. The members of old and new societies are being trained to manufacture goods according to standard patterns and specifications of the handloom Marketing organisation.

An impetus has also been given to the organisation of co-operative societies among cane-growers. Government have for this purpose appointed two special officers under the co-operative department. The officers are assisted by the 10 organisers who work under them. It is hoped that these societies will help the proper cultivation of cane and remove the growers' difficulties in the matter of good seed, manure, transmitting their produce to the factories at the right time and finding a profitable use for it if there is no demand from the factories.

Increased attention is being paid to the organisation of special types of societies, but such societies are started only where there is a genuine demand for them.

Central Provinces.—There is no such society in this province needing such aid.

Delhi.—The action mentioned in previous (1931, 1932 and 1933) reports was continued.

Madras.—There were 12 land reclamation co-operative societies at the end of the year 1933-34 and 11 societies at the end of 1934-35. The societies owed to Government on 30th June 1935 Rs. 1,67,895. There were two Junior Inspectors in 1933-34 and one Junior Inspector in 1934-35 attached to these societies. This special staff has been abolished with effect from 1st April 1936.

A special staff of seven Junior Inspectors was working for the supervision and development work of loan and sale societies in 1934. An additional Junior Inspector was sanctioned in 1935. Among the loan and sale societies which borrowed from Government, the Ambur Agricultural Improvements Society (since liquidated) is the only society which is indebted to Government. Government sanctioned a grant of Rs. 1,500 to the Coimbatore Devanga Weavers' Society in 1933-34 and of Rs. 400 during each of the two years in 1933-34 and 1934-35 to the sales depot at Calicut under the supervision of the Malabar Devadhar Rural Reconstruction Trust.

North-West Frontier Province.—Government has provided increased staff for Consolidation of Holdings work.

Punjab.—The Government grant to the Punjab Co-operative Union has been further reduced i.e., to 1.04 lakhs, as against 1.34 and 1.14 lakhs for the 2 years before. On the other hand, Government maintains an ever-increasing staff in 1934-35 (8 Inspectors and 10½ Sub-Inspectors) for the consolidation of holdings.

United Provinces.—Special grants are given by Government for rural reconstruction and adult education. Grants for other special activities are not usually given. A subsidy of Rs. 10,000 however was given by the Government of India in 1935 for the co-operative marketing of sugarcane, and a small sum was given by Government for helping the organization of ghee sale societies.

92. Government expenditure on Education and Audit (paragraph 378).

Bengal.—The cost on account of audit and audit staff is mainly met from the audit fees realised from the societies. The local Government bear the cost for the audit of societies less than 18 months' old and co-operative anti-malarial societies which are exempted from payment of audit fees. For the anti-malarial societies a staff of 11 auditors is maintained at present.

Central Provinces.—In Berar the audit of all co-operative societies continues to be carried out by the auditors of the department free of charge. The total cost to Government on the co-operative department aggregated Rs. 2,06,272 and Rs. 1,99,857 in the financial years 1933-34 and 1934-35 respectively. A grant of Rs. 24,000 was given to the Institutes during each of these two years towards the costs of the better education and supervision of societies.

Madras.—The six training institutes referred to in the previous reports were given a subsidy of Rs. 2,000 for 1934. These institutes have ceased to conduct classes on the old lines. These have ceased to train candidates for service in the department. A Central Co-operative Institute for the purpose was started under the direct management of the Government in October 1934 and in 1934-35 Government spent Rs. 2,042 on it. The actual expenditure of the institute from 1st April 1935 to 29th February 1936 was Rs. 5,563. The old institutes are to train candidates for work under non-official organizations, central banks, unions, etc. These continue to get Government assistance and classes are now held in these institutes in rotation under the auspices of the Provincial Co-operative Union. A class was held in Vellore and it was given a subsidy of Rs. 550 to cover the cost of two instructors; the cost of a Sub-Deputy Registrar who worked as the Superintendent of the peripatetic class was also met by the Government. During 1935 Government paid a subsidy of Rs. 550 to the Hood Co-operative Institute, Tanjore, for running the second peripatetic class and they met the cost of a Sub-Deputy Registrar-Superintendent.

Concurrent audit of urban banks and central banks was continued besides the audit of village societies. There were altogether 295 Inspectors engaged on audit duty in both the years. Audit fees were recovered from societies with a working capital of over Rs. 20,000. The audit fees recovered in 1934 came to Rs. 49,979 and in 1935 to Rs. 62,229.

Punjab.—See remarks against item 86.

United Provinces.—Nearly half the cost of both education and audit is met by Government.

93. Concessions to Co-operative Societies (paragraph 379).

Bengal.—Exemption from the payment of fees payable under the law of registration has since been partially withdrawn by the imposition of O. and P fees on the documents registered by the Co-operative Societies.

Bombay.—The staff of Special Recovery Officers which was recruited from the Revenue Department to give effective aid to co-operative societies in the matter of recovery of their dues, under section 59 of Bombay Co-operative Societies Act, VII of 1925, has been continued up to now.

Central Provinces.—In order that the holders of occupancy land should be able to take advantage of co-operative land mortgage banks, the Central Provinces Tenancy Act has been amended permitting transfers of such land in favour of land mortgage banks.

Madras.—No fresh concessions were granted to co-operative societies during the two years under report. The land mortgage banks continue to be exempt from the full fees payable for the registration of documents and the obtaining of encumbrance certificates.

United Provinces.—The facilities available at treasuries and sub-treasuries are already availed of by co-operative societies, in so far as they are required.

94. Attitude of officials to Co-operative Movement (paragraph 380).

Central Provinces.—Officers of the Agricultural and Veterinary Departments continue to take interest in the movement. Revenue officers are generally unable to find time to take interest. The revenue officers inspected twenty-nine societies only.

Coorg.—The officials co-operate heartily with the movement.

Delhi.—The attitude of Government officials continues to be sympathetic and they give help wherever possible.

North-West Frontier Province.—Attitude of the Government officials of the other departments had been favourable to the movement.

Punjab.—The efforts to co-ordinate the work of women's societies with other women's activities under the control of the Education Department, have continued. Generally speaking the attitude of officials to the co-operative movement is good.

United Provinces.—District Officers and their staff usually help the co-operative movement. Officers of the Agriculture, Public Health, Education and Industries Departments also assist the movement, where necessary.

95. *Land Mortgage Banks (paragraphs 381—384).*

Bengal.—Five Land Mortgage banks have now been established and it is the intention of Government to increase the number if this experiment proves successful.

Bombay.—As a result of the recommendations of the Committee appointed for this purpose, ten more Land Mortgage Banks have been registered at selected places with one Provincial Bank at Bombay.

Central Provinces.—Government has guaranteed the principal of, and interest on, debentures to be raised for providing the capital of Land Mortgage banks to the extent of Rs. 50 lakhs. Eight more land mortgage banks have been established in the province in addition to the two mentioned in the last report.

Coorg.—The Economic Enquiry Committee have come to the conclusion that the establishment of Land Mortgage Bank for the redemption of rural indebtedness is necessary. The Provincial Co-operative Conference held in December 1935 have also resolved on the desirability of opening one.

Madras.—The Madras Co-operative Land Mortgage Banks Bill, which was pending at the time of submission of the last progress report, became law in 1934. This Act has enabled Government to guarantee the interest on, and the principal of, the debentures issued by the Central Land Mortgage Bank. The guarantee at present extends to all the debentures issued prior to the commencement of the Act and to the debentures issued subsequently, subject to a maximum of one crore, exclusive of the debentures that may be redeemed from time to time, and subject also to the condition that the rate of interest on the debentures does not exceed 5 per cent. and the period of debentures does not exceed 25 years. The Indian Trusts Act was also suitably amended to include these debentures in the list of trustee securities. The debentures are becoming increasingly popular with the investing public and are occasionally quoted on the stock exchange. The Central Land Mortgage Bank has been able to float 3½ per cent. debentures successfully and the benefit of the cheapness of money has been extended to the borrowers. The bank has been issuing loans to the primary Land Mortgage Banks at 5 per cent. and the latter has been issuing loans to the ryots at 6 per cent. The bank has been considering the further reduction of the rate of interest so that the agriculturist can get loans at 5½ per cent.

There are 78 primary land mortgage banks and they have been making steady progress. For the work in connexion with these banks there are 20 Sub-Deputy Registrars, besides the two Deputy Registrars whose cost has hitherto been borne by the Government.

In addition to the Registrar of Co-operative Societies, who is an ex-officio member, there are two nominees of the Registrar on the Board of Directors of the Central Land Mortgage Bank. On the boards of management of the primary mortgage banks also there are to be two nominated directors under new model by-laws. One of them is to be nominated by the President, Central Land Mortgage Bank, and the other by the Registrar.

Punjab.—Owing to the economic depression mortgage banks are at an almost complete standstill. The possibility of reviving them is under consideration, but it is doubtful whether they have any future in this province until the Land Alienation Act is amended in their favour. This at present is not practical politics.

United Provinces.—The Co-operative Land Mortgage Society at Saidpur (Ghazipur) has been working for over five years, and similar societies have been formed in four other districts. The total advance made by these societies during 1935 amounted to Rs. 40,625. They own nearly 20 per cent. of their working capital.

96. *Single versus Multiple Purpose Societies (paragraph 385).*

Central Provinces.—No such society has been formed.

United Provinces.—Societies for providing credit are generally single purpose societies. Other societies, having little to do with finance, carry on multiple activities.

97. *Encouragement of Co-operative Purchase and Sale (paragraph 387).*

Bengal.—A scheme is under consideration by Government for the establishment of experimental jute and paddy sale societies on co-operative lines with the help of the Government of India's grant for rural reconstruction.

Central Provinces.—Four new agricultural associations which purchase implements and seed for retail sale to members were registered.

Coorg.—The co-operative purchase and sale has received increased attention during the period under report and there were 3 crop, loan, sale and supply societies, 5 consumers' societies and 2 High School Students' stores thus bringing the total to 10.

North-West Frontier Province.—Enquiries were made during the period under report as to the possibility of starting a co-operative Commission Shop at Takht Bai, but that has for the present been abandoned as it was found impossible to raise share capital and an efficient and reliable managing committee. The only registered sale society was Sheikh Mohammadi Co-operative Sale Society, which was organised for the sale of grapes. This society receives the support of the Director of Agriculture who supplied a Marketing Officer and staff to organize the sale of their product. At the same time the produce of others in the neighbourhood who were not members of the sale society was also attracted and handled.

United Provinces.—Co-operative organization has so far been set up in five districts to deal with sugarcane supply to factories. The Dehra Dun Society supplied 3½ lakhs maunds of cane and earned a commission of Rs. 3,419 in 1935. The Meerut Society earned Rs. 20,000 in commission. Sitapur has got 192 primary societies affiliated to the Biswan factory. Gorakhpur has two central societies with 184 primary societies affiliated to them.

The membership of the ghee sale societies in the Agra district was 661 in 1934 and 977 in 1935.

The cotton sale society has been referred to under item 68; it made a profit of Rs. 4,000 in 1934 and of Rs. 12,000 in 1935.

98. *Expert advice to Co-operative Societies (paragraph 388).*

Central Provinces.—No necessity of a special appointment for this purpose has been felt so far.

Delhi.—Expert advice is given whenever it is sought.

Central Provinces.—The Sugar Technologist to the Imperial Council of Agricultural Research and the officers of the Agriculture and Industries Departments have been helping co-operative societies with their advice, when necessary.

Special Inspectors for textiles and leather are also attached to the Co-operative Department.

99. *Appointment of Agricultural officers to work under Registrars of Co-operative Societies (paragraph 388).*

Central Provinces.—Owing to financial stringency the agricultural assistant whose services were lent free of charge to the Akola Central Bank for managing the lands of the members of the primary society has had to be withdrawn. No further action has been taken on the suggestion yet.

United Provinces.—Special staff has been appointed for the improvement of the cultivation and marketing of cane in areas adjoining certain sugar factories; the scheme is financed partly by the factories concerned and partly from the Sugar Excise Fund. There are two ranges, one of which is under the control of the Director of Agriculture, and the other under that of the Registrar, Co-operative Societies. Officers of the Agriculture Department in the latter range work under the Registrar.

100. *Encouragement of official and Honorary Workers to study Co-operative Developments in other Provinces (paragraph 389).*

Bengal.—The Registrar and a non-official delegate attended the 11th Conference of Registrars at Delhi in January 1934. Representatives of Co-operative Institutions attended the joint annual meeting of the All-India Co-operative Institutes' Association held at Amraoti (Berar) in June 1934. The Bengal Provincial Co-operative Bank sent two of its directors to Madras to study the working of the Madras Land Mortgage Banks in 1934; the cost of their visit was met by the Bengal Provincial Bank, Limited.

Central Provinces.—The Registrar, one Assistant Registrar and some honorary workers visited various places in the Madras Presidency to study the working of land mortgage banks.

Delhi.—The Inspector Co-operative Societies Urban was deputed last year to study the progress of the movement in the Bombay Presidency.

North-West Frontier Province.—See remarks against item No. 90.

United Provinces.—The Registrar spent 5 weeks in the Punjab during the summer of 1935 studying the progress of the movement there. Two Assistant Registrars and one inspector accompanied him there for some time.

CHAPTER XIV—The village.

101. Medical Aid (paragraphs 401—404).

Baluchistan.—A Malaria Survey Unit under Major Mulligan, M.D., D.Sc., I.M.S., Malaria Survey of India, Kasauli, was sent to Quetta in July 1935, the results of which are recorded in his Report on Malaria in Quetta with special reference to the Programme of Reconstruction. He also visited Loralai and Fort Sandeman in May 1935 and carried out preliminary reconnaissance there.

Free quinine was distributed to Malaria stricken people in the Quetta-Pishin District in 1934. In 1935 the Government of India made a special supply of 1,250 lbs. of quinine for free distribution in 1935-36, 1936-37 and 1937-38 in the Province. This is being done through Hospitals and Dispensaries according to local requirements in addition to the normal consumption of quinine to enable treatment to be carried out more thoroughly. There was an improvement in the health of people generally and sanitation of towns and villages where dispensaries exist.

One more Sub-Assistant Surgeon was deputed to Karnal for special training in Malaria during 1934. A small laboratory for doing a preliminary investigation and survey of Malaria was established in Sibi.

One Assistant Surgeon and one Sub-Assistant Surgeon were deputed to undergo the D.T.M. Course at Calcutta in October 1935.

Delhi.—Attention is invited to the remarks in the report for the year 1931. A scheme for a travelling dispensary for the rural area is being prepared.

Madras.—Please see the report for the period ending December 1933. The total number of subsidized rural dispensaries during the calendar years 1934 and 1935 was 406 and 407, respectively, excluding dispensaries of Indian medicine and rural dispensaries of allopathic system run at the entire cost of the local boards.

North-West Frontier Province.—The establishment of two more fixed rural dispensaries was undertaken in the period under report, one at Ziarat Kaka Sahib in the Peshawar District and the other at Ghazi in the Hazara District. Funds for the dispensary building at Ziarat Kaka Sahib were donated by Khan Bahadur Mian Feroz Shah, a Timber Merchant of the locality, who also contributes Rs. 600 per annum towards the cost of medicines, etc., required for this dispensary. The staff has been provided by Government and the dispensary has been opened for work from 1st October 1934. The dispensary at Ghazi is under construction and will be ready for work before the close of the year.

A small out-door dispensary in charge of a compounder was also started at Pabbi village in the Peshawar District in May 1934 and the patients are charged one pice per prescription and the proceeds thus realized are utilized for obtaining medicines required for the dispensary.

The system of placing villages in the visiting charge of doctors attached to established hospitals in the neighbourhood has been extended to 5 more villages during the period.

The scheme of subsidising medical practitioners is working satisfactorily. Owing to paucity of funds, however, the scheme could not be extended to any more villages. It is however hoped that this will be possible in the next financial year.

In order to further medical aid in such rural areas as cannot be served by the staff of the existing hospitals, two travelling dispensaries are now working, one each in Peshawar and Hazara Districts. These dispensaries tour in lorries in each Tahsil of the district in accordance with fixed programmes which are announced in advance. Pamphlets and posters on rural uplift are also distributed free to the villagers through these travelling dispensaries.

With a view to provide facilities for confinement of females in rural areas where the incidence of deaths due to Child-birth is very high, ten trained dais were subsidised, one each in ten selected villages in 1934, as an experimental measure on a subsidy of Rs. 25 per mensem each. They are required to attend labour cases in the villages on a nominal fee and maintain a register of all cases attended. Their work is inspected by the Civil Surgeons of their districts when on tour. The experiment has proved successful and will it is hoped be extended to other selected villages in the ensuing financial year.

United Provinces.—The district health service was extended to two districts in 1934, making a total of 30 districts in which this service is in force. No extension was possible during 1935 owing to lack of funds.

The scheme of employing a resident public health official (vaccinator) for a group of villages was continued during 1934 and 1935 in two tahsils of the Gorakhpur district.

The health unit in Partabgarh is being continued. The scheme was re-organized to bring its activities in line with actual rural conditions, viz.:

- (a) urban methods were given up as unsuited to rural life;
- (b) training of indigenous dais has been pressed forward;
- (c) recording of births and deaths has been improved;
- (d) trench pattern latrines and urinals on soakage-pit system have been constructed in place of bored-hole latrines, which bred blue-bottle flies;

- (e) medical relief for minor ailments was introduced; and
- (f) other types of sanitary convenience, e.g., bathing platforms, etc., were introduced.

Nine "modified" health units have been started in the Meerut, Moradabad, Allahabad, Jhansi, Benares, Gorakhpur, Lucknow, Fyzabad and Agra districts. They incorporate methods of work adopted in the Partabgarh health unit, with the modification that the District Medical Officer of Health and some other officers of the Public Health Department have been placed in supervising charge, instead of employing a separate Medical Officer of Health; the subordinate staff consists of three sanitary inspectors, one health visitor, six midwives, six indigenous dais and five apprentice vaccinators. The cost of these units is Rs. 11,000 as against Rs. 30,000 of the Partabgarh unit, the number of villages and population being the same. Medical relief on a more extensive scale has been provided in these units.

A recent development in health publicity is the fitting out of bullock carts with inexpensive models for touring in villages connected with kachcha roads, where the department's motor lorry cannot reach. Such carts are working in four districts.

Considerable emphasis is being given to maternity and child welfare work. A portable dai's box was designed in 1935 for issue to trained indigenous dais containing simple requisites essential for clean midwifery practice, and printed instructions in Urdu, Hindi and English as to the use of the articles contained therein; about 135 such boxes have been issued.

An Act for the registration of nurses, midwives, assistant midwives and health visitors was passed in 1934, and applies to rural as well as urban areas.

Government continued to make grants to local boards and individuals for the expansion of medical relief in rural areas. The number of subsidized dispensaries working under the rural area scheme was 47 in 1935 as against 46 in 1934. The number of private medical practitioners who settled in rural areas was the same in 1935 as in 1934, viz., 21. The number of dispensaries working under the revised rural area scheme for the extension of medical relief to women was the same as before, that is, 12. Grants were sanctioned to three women's dispensaries in rural areas.

The village aid scheme was in operation in 1,738 villages (of which 367 had co-operative societies) and in part in 6,235 villages; more than 48,000 village aiders were trained; and there are 1,100 trained midwives. The number of medicine chests kept in societies is 1,725, and 330,766 persons were supplied with medicines. The number of societies maintaining vital statistics is about 600 and that of members and their dependants vaccinated totalled about 2 lakhs.

The operations of the Government Quinine Factory continued to expand. Tablets of the value of Rs. 33,180 were sold during 1934-35. By certain re-organizations carried out by the Public Health Department, the cost of one treatment containing three packets of five tablets of three grains each has been reduced from four to three annas, while the system of sales through the post offices and the agency of other departments has been extended.

During 1935, the Government of India gave 6,000 lbs. of quinine free to this Government for distribution in malaria stricken areas. A scheme for converting this drug into tablets and distributing it free of cost to persons actually suffering from malaria in rural areas is being considered by Government.

102. *Improvement of water supply (paragraph 406).*

Bengal.—The Government of Bengal made as before a grant of Rs. 2 lakhs in each of the years 1934 and 1935 for the improvement of rural water-supply.

Due to economic depression district boards generally could not take loans from Government for the improvement of water-supply; only one district board took a loan of Rs. 15,000 in 1934.

Some more union boards were established during these years. They have powers to take sanitary measures including the improvement of local water-supply.

Central Provinces.—On account of the financial stringency very little could be done for this during 1934. During the financial year 1935-36 however liberal grants have been made to district councils for improvement of water-supply in rural areas out of the allotment of one lakh from the Government of India's grant for rural development.

Delhi.—The Shahdara Water Works have been completed, but the number of connections taken is not sufficient. Efforts are being made to improve matters. A full programme has been worked out for the improvement of wells for drinking water in the rural area of the Province and work has been started in three zails. The cost is being met by a special grant received from the Central Government.

North-West Frontier Province.—During 1934 grants amounting to Rs. 25,000 were given to various District Boards for supply of water in the rural dry areas.

United Provinces.—The question continues to receive the attention of the Public Health Department. The experiment of fitting the "noria" or persian wheel in the health unit area in Partabgarh has not been a success owing to the constant supervision it requires.

Nearly 3,700 wells were provided by co-operative societies with sanitary parapets, and about 20,000 wells were disinfected or cleaned during the last two years.

103. *Addition of Fish to Cultivators' Diet (paragraph 415).*

Bihar and Orissa.—The distribution of carp fry in the province was carried on successfully during 1934-35. During 1934 only two centres, viz. Patna and Cuttack, were working and a supply of 820,000 fry was made, while in 1935 all the three centres, viz. Patna, Cuttack and Sambalpur, continued to distribute fry and a quantity of 331,500 fry was supplied to parties. At the request of the Industries Department the District Council (Board) of Sambalpur has for the past few years been stocking their tanks with fish for the benefit of the villagers.

Madras.—The scheme of research in possibilities of pisciculture in ponds and wells in rural areas sanctioned by the Imperial Council of Agricultural Research is still awaiting the allotment of funds. As it was expected that the grant would be made in 1934-35, the Madras Government provided a sum of Rs. 19,500 in the Budget Estimate of 1934-35 for the construction of fish ponds at Chetput. The Council, however, stated that it was not possible to give an assurance that they would finance the scheme during 1934-35 or even in 1935-36, but that there was every likelihood of their financing it in 1936-37. In the circumstances, the Madras Government has deferred the execution of the scheme till the grant from the Imperial Council of Agricultural Research is forthcoming.

Refrigeration.—A detailed scheme for the establishment of a research station for fish refrigeration will be submitted to the Government for transmission to the Council when completed.

United Provinces.—No special action was taken to induce cultivators to eat fish.

104. *Research into Problems of Human Nutrition (paragraph 417).*

Baluchistan.—No action has yet been taken in this direction.

Central Provinces.—As stated in the Second Report.

No further progress has been made in the matter as owing to the financial stringency Government is unable to provide the necessary funds for the activities of the Public Health Institute.

Delhi.—Lectures and demonstrations have been given with regard to well balanced diets suitable for rural areas wherever possible. Full advantage has been taken of the Exhibitions and Health Weeks that have been held in the different parts of the rural area. It is a well known fact that even in the rural area green vegetables are not consumed in many cases. This fact has been brought to the notice of the villagers and the necessity of such articles forming a regular portion of their diet has been impressed upon them.

North-West Frontier Province.—The North-West Frontier Province Pure Food Rules 1931 were extended to the Nawanshahr Notified Area during the period under report.

United Provinces.—A thesis prepared by a private research worker on the foods consumed in a Hindu village is being published by the Government.

105. *Co-operative effort to improve amenities of Village Life with special reference to Uplift Campaigns and Rural Community Movements (paragraphs 421—424 and 429).*

Baluchistan.—No action has yet been taken in this direction.

Bengal.—There was no co-operative effort in any school to improve the amenities of general village life with reference to uplift campaigns and rural community movements except through the activities of boy scouts and Bratacharies connected with schools. Government have published a tentative scheme for the re-organisation of rural primary education, which, if carried into effect, may go a great way towards the solution of the problem.

Bihar and Orissa.—Out of the Government of India grant of Rs. 12½ lakhs for the economic development and improvement of rural areas a sum of Rs. 40,000 has been sanctioned by Government for opening 4 centres of village welfare for five years in Bihar. A sum of Rs. 10,000 has been placed at the disposal of the Government of Orissa. In Bihar 4 Welfare officers and 4 guides will be appointed to carry on the work in the 4 divisions of the province. They will be first trained in the principles of co-operation and rural welfare and methods of village organisation. Co-operators have realised the importance of rural reconstruction and attempts in this direction are being made at various places.

During the years 1934 and 1935 a few more village welfare societies have been started in Orissa, Chota Nagpur and Bihar proper.

Bombay.—The officers of the Co-operative Department are instructed to devote greater attention to this kind of work. As a result, several Better-Living Societies have been organised and registered.

Central Provinces.—The rural uplift scheme at Piparia in the Sohagpur tahsil of the Hoshangabad district has been extended up to the 31st October 1936. The Village Uplift Board has shown considerable activity during the period under report. Village uplift work has also been undertaken in two villages in Berar by the Servants of India Society. The activities include the provision of soak pits and bore hole latrines, the proper storage of manure in pits, the provision of roads and the general cleanliness of the villages.

Delhi.—Attention is invited to the remarks made in the report for the year 1931. Improvement continues, but very slowly. It is gratifying to note, however, that the Delhi Health and Baby Week Society considered the appointment of a publicity officer in the year 1935 for Health, Education, and this officer has now been actually appointed. This is a move in the right direction, and it is hoped that the hygienic consciousness of the people will be roused as a result of sustained propaganda work. The Central Village Welfare Board, Delhi, is also trying to effect a certain amount of improvement in one or two villages.

Madras.—Please see the report for the year ended 31st December 1933.

There are no rural reconstruction societies. But efforts are being made to start better living societies in the Presidency. The objects of these societies are to reform bad customs prevalent among the members, to prevent reckless and extravagant expenditure on festival and feasts, to inculcate habits of thrift, to provide educational assistance to members' children, to improve rural sanitation and to promote other measures designed to encourage in their members the spirit and practice of mutual help and self-help. A few societies have been started during 1935. Their working will be watched with interest.

The Provincial Co-operative Union continues to maintain rural reconstruction centres in selected areas in the Presidency. Some centres were closed and new ones started. But the centres supported have generally been not less than six. The beneficial activities of these centres were confined to giving rural medical aid, starting panchayats, popularizing bore-hole latrines in villages and doing propaganda on improved methods of agriculture etc. Quarterly progress reports of work done were reviewed by the Madras Provincial Co-operative Union.

The rural development scheme at Trivellore launched by the Health Department, which was referred to in the previous report, was given up and the Special Co-operative Inspector who was deputed to assist the scheme in co-operative work was withdrawn.

North-West Frontier Province.—Special attention was paid to the uplift of villages. Officials of the Department were instructed to take every opportunity of bringing home to the people the advantages of using modern implements, good seed, and manure, as well as the benefits of sanitation and education.

At the Fair held at Kohat in the month of March 1935, a Drama was staged, in which were exposed the evils resulting from unnecessary borrowing and the spending of large sums on ceremonies.

All societies have adopted moral bylaws restricting expenditure on marriage and death ceremonies. In some societies the vicious custom of purchase and sale of brides has been prohibited.

Punjab.—The action taken on these recommendations has already been mentioned in the report sent in 1929. A special grant of about Rs. 24,000 per annum for 3 years has recently been made to encourage the formation of better living societies in order to provide in as many villages as possible the indigenous organisation which is essential to any permanence in rural reconstruction.

United Provinces.—Progress towards increasing the amenities of village life is being maintained. The number of primary societies working exclusively for village welfare is 356; in addition, there are 6 central societies. Co-operative reading clubs or adult schools number 249, with an enrolment of 5,017. In 3 districts, selected villagers are trained in rural reconstruction work under supervisors. These trained guides are employed for a group of village societies. Village school teachers in three tahsils were trained; this scheme aims at making the village school the centre of the welfare movement, the teacher acting as the guide.

The number of Junior Red Cross groups rose from 1,640 in 1933 to 3,057 in 1935, and the membership from 46,711 to 89,891; 93 per cent. of these groups are in rural areas.

The scheme of rural development has been brought into force in all the districts of the province, except the three hill districts. There are six organizers and one inspector in each district. The first step taken is to create a sanitary consciousness by having manure pits, soakage-pits, cleaning of the village sites, and improvement of water-supply in the villages. Medicine chests have been supplied to all the villages in the 270 circles, and they are proving popular. Attention is also being paid to the economic side of the activities and demand is being created for improved varieties of seeds, etc. In a few places, village demonstration plots are being opened to teach improved technique in cultivation.

Cultural improvements are also attempted, and, in many places, efforts are being made for the opening of village halls, evening classes and playgrounds, and for introducing village games and sports. The District Officers and other workers have been endeavouring to make the view clear that while people can be taught to keep the village clean, improve their ways of living and their methods of farming, the actual work of reconstruction is the work of the people themselves.

106. *Assistance from Universities in Work of Rural Development (paragraph 426).*

Delhi.—The action mentioned in the report for the year 1931 was continued.

United Provinces.—University students do not appear to find the time required for continuous work in connexion with rural development; occasional visits leave behind no lasting impression.

107. *Establishment of Bureaux of Rural Economic Research (paragraph 427).*

Punjab.—The Board of Economic Enquiry continues its valuable enquiries and publications.

United Provinces.—There is a bureau of statistics attached to the Board of Economic Enquiry, which undertakes rural economic research.

108. *Settlement of village Disputes by Local Arbitrators (paragraph 431).*

United Provinces.—The Panchayats of many co-operative societies settle village disputes by arbitration.

The number of village panchayats for deciding petty cases increased from 4,275 in 1934 to 4,298 in 1935, while the number of panchayats which were granted enhanced powers was 101 in 1934 and 88 in 1935.

CHAPTER XV.—Education.

109. *Female education (paragraph 444).*

Baluchistan.—Attention is invited to the remarks in the report for 1931. The number of girl students on the 31st December 1934 was 2,031 out of which 87 were locals. The number of girl students in Government institutions on the 31st December 1935 was 349 out of which 42 were locals. No figures can be furnished in respect of aided institutions owing to the records having been destroyed in the earthquake.

Bengal.—People of all castes and creed have now fully realised the necessity for the education of women and it is hoped that steady progress in the secondary as well as primary schools will be made as soon as increased funds are available.

Bihar and Orissa.—The number of girls reading in institutions for girls increased by 1,081 in 1933-34 and by 3,594 in 1934-35. More striking still is the progress of co-education, where the figures show that the number of girls reading in boys' schools increased by 5,426 in 1933-34 and again by 6,271 in 1934-35. Girls reading in boys' high schools were 402 in 1933-34 and 113 in 1934-35, while in men's colleges the number of female students increased from 9 in 1933-34 to 15 in 1934-35. It is generally recognised that at the primary stage girls make better progress in mixed schools than in special schools for girls.

Bombay.—The Local Authorities continue to keep in view the spread of literacy among women. Efforts similar to those employed in the case of boys have been made for the spread of literacy among girls. The number of girls attending schools is increasing steadily. The number of girls under instruction in primary schools increased by over 26,000 during the years 1933-35. The girl-guide movement has proved a good stimulant for attracting more girls to schools. Men teachers in girls' schools are being replaced by women and a few School Boards are trying the experiment of appointing women teachers in boys' schools. The progress would be very slow in this respect.

Central Provinces.—Three Anglo-Vernacular Middle Schools and 40 primary schools were newly opened in the years 1933-34 and 1934-35. Of the above, one Anglo-vernacular and twenty-nine primary schools were opened by local bodies, which received an additional grant of Rs. 3,391 for primary schools. The Anglo-vernacular middle school is not aided.

Though the figures of progress in general literacy in the population of the province could not be known (as there has been no census since 1931), the percentage of female scholars to total female population of the province has increased from 0.90 to 1.02, while the percentage of school-going children in general to the total population increased from 3.02 to 3.23 during the period.

Delhi.—Attention continues to be paid to this recommendation. There are 17 girls' schools in the rural area, out of which 12 are District Board and 5 aided schools; 5 of them are single teacher schools. The total number of girls on the rolls is 662. Of the 32 teachers employed in these schools 29 are trained and 3 untrained.

Co-education exists in 10 District Board and aided schools.

A Government Normal School for training female teachers is located in Delhi.

United Provinces.—The number of girls reading in schools and colleges has increased by 55,522 since March, 1930.

Twenty-six new institutions for girls were established during 1933-34 and 1934-35. Extended facilities are given to female candidates for admission to training colleges, and a State scholarship for study in the United Kingdom is awarded every year to a woman candidate. Co-education in primary schools is increasing.

As regards the influence of female education in preventing a relapse into illiteracy, the results of an investigation made into the matter shows that where families interested in female education exist, the mother's influence is important, but the number of literate women, though increasing, is so far very small in villages. There are 15 co-operative registered and 54 unregistered societies which are mostly educational, and propagate ideas of thrift, care of children, curtailment of ceremonial expenditure, etc.

The number of girls related to members of credit societies who attend primary schools is now 3,551.

110. Introduction of Compulsory Primary Education (paragraph 445).

Bengal.—The partial scheme under the Bengal (Rural) Primary Education Act, 1930, has now been introduced in ten districts in the Province. The School Boards established in those districts are settling preliminaries with a view to the eventual introduction of compulsory primary education when the education cess is imposed.

Bihar and Orissa.—There have been no developments in compulsory education. The experiment in the Banki Union area of Cuttack district is still showing fair results, but the Cuttack district board finds the financial burden of the experiment difficult to bear.

Bombay.—No new scheme of compulsion was sanctioned during the period under report for want of funds. The total number of Local Authorities that have introduced compulsion continues to be 12, but in no case is compulsion rigidly enforced. The School Boards rely mostly on persuasive methods.

The District Local Boards and Local Authority Municipalities continue to keep the aim in view and although owing to financial stringency the activities of Local Authorities in respect of expansion of Primary Education were restricted, there has been a general rise in the number of pupils attending schools in rural areas. During the years 1933-34 there was an increase of 21,000 pupils under instruction in primary schools in rural areas.

Central Provinces.—There has been no further progress under this head owing to the prevailing financial stringency in the province. No new schemes have been prepared by local bodies or sanctioned by Government.

Delhi.—The Punjab Primary Education Act, 1919, applied to 17 villages at the end of the year 1935. It has proved very successful in its working.

Madras.—The Madras Elementary Education Act, 1920, has been amended. The Amendment Act (Madras Act XI of 1935) empowers the local Government to compel local bodies to submit schemes for the introduction of compulsory elementary education. The Act also contemplates the introduction of a partial method of compulsion by which pupils of school-age once admitted into a school will be retained in it till they complete the school course. A sub-committee of the Provincial Economic Council has been constituted to consider the question of introducing compulsory elementary education in all villages with a population of 5,000 and above. The committee has not yet concluded its deliberations.

United Provinces.—Compulsory primary education for boys is in force in 36 municipalities and 25 district boards, and is being extended to one more area in the Bijnor District.

Compulsory primary education for girls has also been introduced in four wards of the Cawnpore municipality during 1935. The question of introducing it in selected rural areas of Lucknow, Bara Banki and Partabgarh districts is under consideration.

Experience shows that the results of compulsion have not been altogether satisfactory, as may be seen from the following figures of classwise enrolment in 35 municipalities:

Class.	Infant.	I	II	III	IV
Year.	1929-30	1930-31	1931-32	1932-33	1933-34
Enrolment	30,289	10,745	6,647	3,244	1,663
% Distribution	50	20	12	6	3

The difficulty appears to be largely economic and it has been found that the poorer people cannot afford to let members of their families, who can earn something, however little, spend their time in schools.

111. Formation of Co-operative Education Societies (paragraph 446).

Bombay.—Except a few night schools for adults there is no provision for adult education as such. No Co-operative Society has so far been formed with the object of promoting adult education among the masses. It is, however, reported that in the Bombay Division some night schools have been started as a result of the Village Uplift Movement. In the Central Division also efforts are being made by private individuals and associations towards the spread of literacy among adults. Spontaneous efforts in consequence of an awakening among the villagers are essential for any real progress in this direction.

Central Provinces.—One more compulsory education society has been organized in addition to the three already existing. Seven educational co-operative societies are actually working at present.

Madras.—There are no education societies in the Presidency.

Punjab.—Adult schools which once numbered several hundred, have dwindled to 2 and are a definite failure. The difficulty has been to secure any continuity of effective teaching. Compulsory Education Societies, too, have declined in number and members. The only encouraging feature is the increase in the attendance of girls.

United Provinces.—Credit and other co-operative societies already existing in villages impress the need for educating both boys and girls. No separate co-operative education societies have been organized.

112. Improvement of Primary Education (paragraphs 447-448).

Bengal.—The remarks under item 110 apply to this item also.

The question of finance comes to the forefront, and unless this problem can adequately be solved, no improvement in primary education is possible.

Bihar and Orissa.—The pressing popular demand for elementary education continues to be superficially met by an increase in the number of schools and the struggle between quantity and quality is now acute.

An important resolution of Government on the report of a representative conference on the subject of primary education was published in February 1935. This extended the lower and upper primary courses to four and six years, respectively, and prescribed a new syllabus. Co-education was to be encouraged and common schools with a common language for Hindus and Muhammadans were to be fostered. The names 'maktab' and 'Sanskrit pathshala' were to be replaced by primary Urdu school and primary Sanskrit school, respectively. The policy previously followed by Government with regard to the staff of primary schools and the minimum pay of their teachers with reference to their qualifications was reaffirmed.

The new syllabus, which demands far more energy and resourcefulness from the teachers, was introduced partially in 1935, but this change unfortunately coincided with the definite recognition of the fact that many controlling bodies, with the funds now at their disposal, cannot pay all their teachers at the minimum rates laid down for teachers of various qualifications. It is too early to judge the effect of the new syllabus, but it may safely be said that there is evidence of a fuller realisation of the need for special care of beginners.

The primary education grants were restored in full in the year 1935-36, but no promise has yet been given that this restoration will be permanent.

Funds have not yet been made available for improving the system of training elementary teachers, but the output of the primary section of the Patna Training College is infusing greater keenness into the junior branches of the inspecting staff.

Bombay.—During the years 1933 and 1935 the percentage of trained teachers has steadily increased. With a view to securing a larger supply of trained teachers with higher training certificates a scheme for the training of 240 additional men and 120 additional women teachers was introduced with effect from June 1935. From the same date the 3rd year classes which were discontinued for the last 12 years were reopened.

Improvements have been effected in the course of Vernacular Training Colleges by thoroughly overhauling the syllabus for the training of teachers.

Most of the Local Authorities have approved in theory the idea of appointing women teachers for small children and in some stray cases women have been appointed. The main difficulty, however, is the scarcity of qualified women teachers. Even in girls' schools there are at present men teachers. The number of girls passing the Vernacular Final Examination every year is rapidly increasing and it is hoped that as time goes on more women teachers will be appointed for small children.

As pointed out in the previous report it is fully realized that one-teacher schools are to some extent responsible for wastage, but Government are unable to provide a second teacher for small schools for want of funds.

Central Provinces.—The experiment that was tried in the Normal School, Seoni, has been extended to the other normal schools in the province. The revision of the normal school syllabus in conformity with the revised primary school syllabus is under consideration.

Revised readers in Hindi, Urdu and Marathi languages were introduced during the period. The curriculum for the primary schools having been revised to suit the requirements of rural and urban areas, details are being worked out with a view to introducing the revised syllabus from 1937. The revision of the text-books will then be taken up again, as the new syllabus is based on the life and surroundings of the pupils.

Delhi.—There is a Government Training School for male teachers situated in the rural area. 175 of the 187 male teachers working in the primary schools and departments in the rural area are trained. During the year 1931-35, 56 teachers were recruited from the rural area for admission to the S. V. and J. V. classes.

The total number of primary schools and departments in the rural area is 110. Out of 76 primary schools in the rural area, 58 are still single teacher schools.

The total population in the rural area is 1,95,738. Out of this at the rate of 7 per cent there should be 13,702 boys of school-going age. During the period under review there were 7,481 boys under instruction or 2,275 more than in the year 1933.

United Provinces.—Special attention is being paid to the training of teachers for work in infant and preparatory classes. New methods are being taught and the head masters of primary schools are themselves required to teach the infant sections.

Rules already exist according to which trained teachers should be appointed in District Board Vernacular Schools, but, if no qualified candidates are available, teachers with lower qualifications can be appointed with the approval of the Circle Inspector of Schools. The importance of employing only trained teachers is impressed on all local bodies.

One District Board Central training school has been converted into a Government institution, and the Allahabad District Board has opened a second central training school.

The District Board Education Rules enjoin on local boards the maintenance of a full primary school as soon as resources permit, within accessible distance of every village. Some district boards have already taken steps in this direction. Instructions have also been issued that, in preparing the list of primary schools, efforts should be made to keep the number of circles sufficiently low to ensure that primary schools will be large multiplo-teacher schools with an enrolment of not less than 100, and that in ordinary conditions a walking distance of $1\frac{1}{2}$ to 2 miles should be considered a reasonable radius of operation for a school.

It is not practicable in the present financial stringency to convert primary schools into lower middle schools.

In the appointment of teachers, preference is given to residents of the town or village in which the school is situated; it has also been recently ruled that, educational qualifications being equal, preference should be given to persons belonging to the agricultural classes.

Text-books for primary schools are prepared, keeping in view the interests of rural requirements. They have been largely ruralized.

The Board of Vernacular Education, consisting of official and non-officials, representing different interests, is now the body which considers and recommends books on the advice of the book committees of different subjects.

Agriculture is not taught in primary schools, but is one of the optional subject for secondary or middle schools.

113. Adult Education (paragraph 419).

Bengal.—Night schools are held in the evening for about two hours daily, and are attended mostly by adults who are unable to attend day classes owing to their occupations. These schools are neither attractive nor efficient, mainly because they are not well organised and financed and those who attend them do not take to their work seriously.

Steps have been taken for the establishment of village libraries in subdivisions out of the funds for rural development recently allotted by the Government of India.

Bombay.—Teachers are now generally recruited from among those who are familiar with rural life. Admissions to Training Institutions are also mostly from the Intermediate and the Backward classes most of whom are drawn from villages.

The question of the revision of the syllabus is under consideration. Several enterprising publishers have published good books and the Educational Department of the Local Government has sanctioned them for use as Text Books.

Central Provinces.—Owing to the economic depression, the number of schools and enrolment in them have steadily decreased. In 1933-34, there were 42 night schools with 1,084 pupils. In 1934-35 there were 36 and 884 respectively. One adult education society has been registered in Berar. Night classes which were started and looked after by the Circle Auditor at Piparia have been closed for want of funds.

Delhi.—Adult schools were kept running for the benefit of illiterate adults.

Madras.—Proposals for the opening of adult education classes in connexion with training schools have been dropped.

United Provinces.—Adult schools under co-operative management now consist of one central institution at Moradabad and 21 primaries in Lucknow, Partabgarh, Benares and Gorakhpur. In addition, there are 228 unregistered societies. The number of adults receiving training rose from 4,544 to about 5,000. Scouting has been introduced in these schools with good results, there being 2,353 members trained as scouts.

114. *Agricultural Middle Schools (paragraphs 456—458).*

Bengal.—The scheme for agricultural education in non-Government secondary schools, sanctioned by Government in 1927, is in operation in 51 schools, viz., 27 middle English (with continuation classes in 15 schools only) and 24 high English schools. Agriculture is taught in these schools in accordance with the departmental syllabus. These schools are generally in fair working order, but there is much room for improvement in them. It is now proposed to concentrate in the first place on the existing schools with a view to ensuring their efficient working.

The whole question was recently reviewed and Government have decided that the scheme should be extended, that all the middle English schools participating in the scheme should be allowed to open continuation classes, as otherwise agricultural teaching in these schools will be incomplete and that in view of the desirability of creating a reserve of trained teachers for filling up vacancies caused by death or resignation of existing trained teachers, a batch of three teachers from the schools already participating in the scheme should be deputed annually for training. These proposals will be given effect to as soon as requisite funds are available. A portion of the allotment for rural uplift made by the Government of India, is being distributed as grants for development of agricultural schemes attached to schools in rural areas.

Bihar and Orissa.—There has been no further extension of agricultural teaching in middle schools, but satisfactory reports continue to be received from the schools where this subject is taught.

Central Provinces.—Since the previous (fourth) report the Anglo-Vernacular Middle School at Betul has been converted into an Agricultural School of the Powerkhora type and it will be taken over by Government from the next financial year.

Delhi.—Attention is invited to the remarks in the report for the years 1932 and 1933. Agriculture was in 1934-35, introduced as an important and compulsory subject in the S. V. unit in the Najafgarh Government Training School. There is a small farm attached to the Najafgarh Government Training School. Efforts are being made to make improvements gradually as funds permit.

Madras.—The original idea of starting an Agricultural Middle school at Kalahasti had to be dropped. The question of running the farm as a demonstration farm without a school attached to it is under consideration.

The school at Usilampatti continued to be under the management of District Board, Madura. The vocational school at Muthanandal run by the Ramnad District Board was closed. It was formally converted into an industrial school.

United Provinces.—The number of vernacular middle schools at which agriculture is taught is still 36. Six new rural knowledge classes, however, were opened in Government normal and central training schools, and the number of such classes is now 126. Profits from farms are distributed among the pupil teachers working on the farms after deducting farm expenses.

The two agricultural schools run by Government impart vocational training to the sons of small zamindars; 147 students passed out of these schools in the last two years.

English is taught as an optional subject in classes V to VII of vernacular middle schools. The number of English classes attached to vernacular middle schools maintained by Government is 120.

115. *Addition of Course in Agriculture to curriculum of High Schools in Rural Areas (paragraph 461).*

Bihar and Orissa.—Two high schools that at Bikram in Patna and the Raj high school at Darbhanga, are now providing practical teaching in agriculture.

Bombay.—The necessity of agricultural education is keenly felt in many of the private high schools. The agricultural course, introduced in two High Schools at Rajapur in

the Ratnagiri District and Bori in the Thana District, has become most successful. The agricultural course introduced in these secondary schools has not come in the way of the general education. On the other hand boys derive great benefit and recreation from the agricultural study. Nature-study and grafting are studied with special interest both by boys and girls in these two High Schools. During the last year an agricultural course has been introduced in another High School at Mahim in the Thana District.

Delhi.—There are four high schools in the rural area in which Agriculture is taught in the High classes. A small canal irrigated farm is attached to the Jat High School, Khara Ghari. The Hailey Rafah-i-Am H. S. Naicla, has also introduced this subject, and the Ramjas High School, Anand Parbat, has also improved its agricultural farm.

United Provinces.—The number of high schools recognized for the teaching of agriculture rose from six to fifteen.

116. Technical Education (paragraph 462).

Bihar and Orissa.—In view of the rapid expansion of the sugar industry in the province, one of the two scholarships sanctioned for the Bihar and Orissa students at the Indian School of Mines, Dhanbad, was temporarily transferred to the Harcourt Butler Technological Institute, Cawnpore, to be awarded to the student selected for training in sugar technology with effect from the year 1933-34. Since 1933-34 one scholar is being sent every year to study sugar technology with a scholarship of Rs. 50 a month *plus* cost of books not exceeding Rs. 100. The student is admitted as a nominee of the Imperial Council of Agricultural Research, India, and as such is, not required to pay the usual charges for training realized by the United Provinces Government from outsiders nor have the Bihar and Orissa Government to pay anything to the United Provinces Government towards the cost of training of such students.

Central Provinces.—Subjects like commerce, agriculture, wood-work, music, metal work, painting, art, needle work have been introduced in the high school curriculum. In middle schools also several forms of hand-work *viz.*, tailoring, spinning, weaving, basket-making, clay modelling, cardboard modelling, wood-work, etc., have been added. In the revised primary school syllabus provision for the teaching of cottage industries has been made.

The whole question of vocational training will be reconsidered on receipt of the proceedings of the Central Advisory Board which met in December last and of the report of the special committee appointed by the High School Education Board for the purpose with the following as one of the terms of reference:—

“The course of study for vernacular middle schools be revised on a vocational basis as an alternative scheme. The vocation should be so chosen as to suit the needs of the locality where the school is situated.”

Madras.—The number of State Technical Scholarships tenable at any one time in the United Kingdom is four. There was one vacant scholarship available and this was awarded during 1935 to a candidate for training in Sugar Engineering in England. In addition to the scholarships awarded by Government another scholarship has become available, thanks to the late Mr. M. J. Murphy, I.C.S., placing at the disposal of the Government the residuary funds of his estate for constituting a scholarship fund the income from which is to be utilized for the award of a scholarship tenable in England to a candidate belonging to the Malabar or South Kanara district for training in industrial subjects. The first scholarship was awarded in 1935 to a candidate from the South Kanara district for training in the glass industry.

The award of scholarships for study in the Victoria Jubilee Technical Institute, Bombay, was temporarily suspended, the funds thus rendered available being utilized for improving training in other industrial subjects in which there is a greater prospect of the scholars finding suitable employment in the Presidency on the completion of their training. The development of the sugar industry having created a demand for sugar technologists, it was decided that the facilities provided by the Indian Institute of Science, Bangalore, and the Andhra University, Waltair, should be taken advantage of to secure a number of young men suitable for work under specialists with a view to their taking up later more responsible posts in sugar factories. Accordingly Government instituted from 1931 two scholarships tenable at the Indian Institute of Science for a period of two years for the study of “Chemical Engineering with special reference to sugar technology” and six scholarships tenable at the Andhra University College, Waltair, for a period not exceeding three years for the study of the B.Sc. (Hons.) degree with technology as the main subject—the chemical technology including the technology of cane sugar.

Government Industrial Schools.—There are four industrial schools under Government management in the Presidency at Madura, Calicut, Bellary and Mangalore. Excepting Madura, the rest are still on a temporary basis. These schools are assisted by a Board of Visitors consisting of officials and non-officials whose functions are of an advisory nature. The final examinations in each school are conducted by a Board of Examiners appointed by the Government consisting of the Superintendent of the school and one outside gentleman. These schools provide at present a five-year course of instruction in wood-work and the engineering trade, and it is proposed to open at Madura from next year an additional class for the training of electricians.

Aided Industrial Schools.—Four new schools were recognized during the period, of which three are carrying on rural reconstruction work, the avowed object of the management being the amelioration of the depressed and backward classes in the area catered for by the schools by providing regular courses of instruction in certain cottage industries with a view to enabling them to earn a livelihood. At the end of March 1935, there were 5,938 pupils receiving instruction in these schools, belonging to different castes and communities, as against 6,199 in the previous year. A sum of Rs. 89,452 was distributed in the form of maintenance grants representing an average of Rs. 15-1-0 per pupil per annua for the Presidency as against Rs. 14-2-0 per pupil per annum in the previous year. There are also three teachers' training centres, one at Tindivanam which provides training for pupil teachers in wood-work, and two for girls at Madras and Palmaner, which provide training in needlework and dress-making.

The system under which maintenance grants are distributed to the aided schools was revised during 1934 with a view to securing greater efficiency and economy in the administration of such grants.

School of Arts and Crafts.—The wood-work, metal work, goldsmith and engraving sections of the school continued to develop, the articles turned out by the students finding a ready sale. Government sanctioned the formation of a regular section to teach enamelling exclusively and the new section was started from July 1935. It is hoped that, as a result of this development, a new line of work will be opened up for the craftsmen of the Presidency and that, in course of time, an artistic enamelling industry will be established. Experiments in regard to cotton printing and painting and leather painting, etc., were also continued.

Leather Trades Institute.—Experiments were carried out in regard to the use of synthetic tans in the tanning of South Indian skins as also in regard to stains on skins and hides. The spent bark available in South Indian tanneries is not made use of except as fuel. Experiments were therefore carried out on the preparation of activated charcoal from the spent tanning materials, *e.g.*, avaram, wattle bark and myriobalam nut. Two methods were employed, *viz.*, gas activation and impregnation. The experiments indicate that activated charcoal suitable for decolorizing sugar solutions can be prepared from spent tanning barks.

Government Textile Institute.—The Institute continued to provide the usual courses of instruction—the Supervisor course and the Artisan course—in addition to special courses in certain subjects, such as jacquard weaving, dyeing, knitting and sericulture; and, during the period under review, power-spinning was included for the first time in the curriculum of the Supervisor course.

Aided Textile Schools.—The aided industrial schools dealing with textiles continued to be under the supervision of the Assistant Director of Industries (Textiles). The efficiency of these institutions is being gradually increased as they conform to the revised curricula of instruction laid down for them.

The purpose of the Kerala Soap Institute, Calicut, is now primarily to impart instruction in soap-making and allied industries and to carry out experimental and advisory work in the sphere of oils and fats. The institute maintains touch with most of its ex-students and their requests for advice and assistance are readily complied with. The manufacture of different varieties of medicated soaps was taken up during the period under review. Research work on oils, fats and allied products continued to be carried on at the institute during the period under review. Coconut oil, groundnut oil and cotton-seed oil have been successfully refined and the products are reported to be satisfactory. Refined coconut oil is now being supplied to several Government hospitals in the Presidency and also to the general public.

United Provinces.—Training continues to be given to a number of students at industrial and technical schools maintained or aided by Government. It is proposed to introduce "tuitional" or "instructional" classes for catering to the needs of artisans. The teacher will himself go to the homes of artisans, settle in their locality for a period varying from six months to two or three years and teach them improved methods of work.

117. Qualifications for admission to Agricultural Colleges (paragraph 471).

Bombay.—The qualification for admission to the courses for the degree in Agriculture of the Bombay University continues to be the examination held by Arts Colleges one year after Matriculation.

Burma.—The question is at present in abeyance owing to the cessation, on financial grounds, of teaching at the Agricultural College since March 1932.

North-West Frontier Province.—Arrangements are now being made at the Islamia College to teach agriculture up to the B.Sc. standard.

At present there are:—

16 students in F.Sc. 1st year.

12 students in F.Sc. 2nd year.

6 students in B.Sc. 1st year.

No student in B.Sc. 2nd year.

United Provinces.—The qualification for admission to the Intermediate course at the Agriculture College, Cawnpore, is the High School Certificate, and for the degree course, the Intermediate Examination or its equivalent.

118. Teaching of Agricultural Economics and Farm Management at Agricultural Colleges (paragraph 472).

Bombay.—The farm management research conducted by the Professor of Agricultural Economics, in the Charotar tract of the Kaira District, has proved to be valuable in imparting practical training to students in this subject.

Agricultural Economics and Farm management are being taught as compulsory course to students of the Poona Agricultural College. Besides, special training in agricultural economics, marketing, co-operation, etc., was given to students selecting advanced agricultural economics as their special subject. Some agricultural graduates are also conducting research in agricultural economics for their M.Ag. degree under the Professor of Agricultural Economics.

North-West Frontier Province.—*Vide* remarks against item 117.

United Provinces.—The teaching of agricultural economics and farm management at the agricultural college is fairly satisfactory; no extra staff could be entertained for further improvement owing to want of funds.

119. Revision of Short Courses given at certain Agricultural Colleges (paragraph 473-474).

Bombay.—The University of Bombay instituted in 1935 a diploma in farm management to be given after Matriculation. No institutions have yet come forward to give this course. There is some demand for special courses in Horticulture and Dairying at the Poona College of Agriculture, which is being met as far as possible.

Madras.—Short courses in ten subjects were sanctioned by the Government at the Agricultural College, Coimbatore, to meet the needs of young men who could not undergo the University Course in Agriculture. Owing to the lack of accommodation, only one course in "Farm Management" was given. Besides this, short courses of instruction in four other subjects, *viz.*, malt-making, insect pests and diseases, jaggery-making and bee-keeping were instituted. The students attending the "Farm Management" Course were permitted to take the other four courses.

North-West Frontier.—*Vide* remarks against item 117.

United Provinces.—Short courses in agriculture continue to be given at the Agricultural Schools, Bulandshahr and Gorakhpur, and refresher courses have also been arranged.

120. The Mandalay Agricultural College in Burma (paragraph 475).

Burma.—Same remarks as under item 117.

121. Provision of facilities to enable passed students of Agricultural Colleges to obtain Practical Experience (paragraph 476).

Bombay.—There are no special facilities.

North-West Frontier Province.—So far it has been possible to absorb in the Agricultural Department all students belonging to the North-West Frontier Province who have qualified.

United Provinces.—Portions of the college instructional farm have been leased to such graduates of the college as desire to obtain more practical experience before taking up farming.

122. Organisation of Agricultural Colleges (paragraphs 477-479).

United Provinces.—The Agricultural College, Cawnpore, as reorganized in 1932, is working satisfactorily. As previously reported, teaching has to some extent been separated from research.

123. Openings for Passed Students of Agricultural Colleges in other departments (paragraph 481).

Bombay.—An Agricultural Graduates' Employment Bureau is now organised under the Principal, College of Agriculture, Poona. This institution is found to be useful in securing appointment for agricultural graduates in other departments such as the Co-operative Department in which agricultural graduates are appointed as Agricultural Organisers.

Agricultural graduates are also being steadily absorbed in the sugar industry.

Central Provinces.—B.Ags. of the Agricultural College are given the same facilities for admission to Revenue Department as other graduates.

Madras.—The Government sanctioned the institution of a course of instruction in Co-operation, auditing, book-keeping and banking at the Agricultural College, Coimbatore, to enable the students of agriculture to qualify themselves for appointment as Inspectors in the Co-operative Department.

United Provinces.—A degree in agriculture qualifies for admission to service in several departments of government.

124. Agricultural Colleges for Bengal and Bihar and Orissa (paragraph 482).

No remarks have been received from the local Governments concerned.

CHAPTER XVI.—Rural Industries and Labour.

125. Government assistance in developing manufacture of Agricultural Implements and in training village artisans to manage and repair improved types of machinery (paragraphs 491 and 494).

Bombay.—In Sind this recommendation is receiving the attention of the newly established Agricultural Engineering Section of the local Agricultural Department.

Delhi.—Attention is invited to the remarks in the reports for the years 1931, 1932 and 1933. Practically no provision exists at present for such assistance. The five-year programme of industrial and technical education of 1932 provided on a moderate scale for the technical training of village artisans and the proposed development of the manufacture of agricultural implements.

Annual rural exhibitions were organised at important rural centres where demonstrations were given in improved processes for the manufacture of agricultural implements and of the working of modern labour saving agricultural products for which there is a growing local demand.

United Provinces.—The technical schools at Lucknow and Gorakhpur continued to assist in repairing agricultural machines and replacing parts thereof, and in training men to do this work.

Iron parts of Olpad threshers are manufactured in the agricultural engineering workshop, and wooden parts of improved ploughs are got made at different centres.

Efforts have been made to evolve improved types of bullock cart wheels and churns.

126. Development of Poultry Industry (paragraph 497).

Bihar and Orissa.—Poultry flocks of white Leghorn variety are maintained at the Patna and Kanke Farms. There has been an increasing demand for eggs and birds. The surplus birds are sold to the public at a low price with a view to gradually improving the local breed of poultry. Selective breeding has now been started at Kanke based on production, capacity, size and breed characteristics.

Bombay.—During the past two years, this subject has become very important. We have now got to the stage where the improved egg is being marketed on a given standard of quality and size. Some 15 villages have been cleared out of country cocks and acclimatized European cocks have been placed in their stead.

Central Provinces.—Work for developing the poultry industry on organized lines has been started with the aid of a grant from the Government of India. Breeding of pure bred poultry is being carried out and cockrels of improved breed are being distributed free to villagers, who are interested in poultry industry.

Delhi.—The five-year programme, referred to in item 125, included proposals, on a limited scale, for the development of the poultry industry, for the products of which there is a growing local demand.

A model poultry farm has been established at Shahdara by private enterprise.

Another private enterprise has been granted Government land for the establishment of a poultry farm in New Delhi.

A scheme with financial estimates was prepared and furnished on request to a person who contemplated the establishment of a model poultry farm in rural Delhi.

Demonstrations on a limited scale were given at the annual rural exhibition organised at important rural centres in the province.

North-West Frontier Province.—Poultry sections have been started at the two Chief Agricultural Stations in the Province.

United Provinces.—The nine co-operative societies for the development of poultry industry and their Central Union continued to work on a limited scale. Their difficulty is to find a suitable market for their eggs. Experiments in drying eggs are said to have been successful, but the commercial aspect of the methods evolved have not yet been examined.

The United Provinces Poultry Association submitted an application to the Imperial Council of Agricultural Research for research in the preservation and handling of eggs and poultry. The I. C. A. R., however, proposes to establish its own research station at Izatnagar.

127. Organisation of village artisans on a Co-operative basis (paragraph 501).

Bihar and Orissa.—The Government of India having announced a grant-in-aid for a period of 5 years from the 1st November 1934 for the improvement of the handloom industry, a scheme for the manufacture and sale of handwoven goods was drawn up by the Industries department and approved by Government during the year. Under this scheme three weavers' co-operative societies were organised in the district of Darbhanga and one in the district of Gaya. These co-operative societies manufactured and supplied to the Central Marketing organisation at Gulzarbagh, Patna, goods worth Rs. 2,939 during the few months of the working of the above scheme in 1935.

The Bihar Weavers' Co-operative Society mentioned in the previous report continued to work satisfactorily and supplied Rs. 20,014 worth of handwoven goods in 1935. Departmental help continued to be given to the Ranchi Weavers' Co-operative Stores in the training of its weaver members, and it supplied handwoven goods worth Rs. 6,429 during the year 1935. The purdah manufacturing section, which is now merged in the handloom marketing organisation scheme referred to above, continued to supply handwoven textiles to the London and the New Zealand agents who sold goods worth Rs. 1,38,468 during the year 1934-35.

Madras—Efforts are being made to place the hand-loom industry on a satisfactory basis. The Government of India have placed the sums of Rs. 26,500 in 1934-35, Rs. 59,500 in 1935-36 and about Rs. 68,800 during 1936-37 at the disposal of the Local Government for the development of the hand-loom industry. A central society, its area of operations, being throughout the Presidency, has been started at Madras; the Registrar of Co-operative Societies, the Director of Industries and the Principal of the Government Textile Institute are ex-officio members of the Board; this society will, it is expected, co-ordinate and assist the activities of the various primary weavers' societies. The central society has arranged for the supply of yarn to the primary societies and has given money grants to meet the establishment and contingent charges. A marketing officer and five supervisors have been appointed. In Malabar, the Calicut Cottage Industries Society managed by ladies has been manufacturing and selling envelopes on a very small scale amounting to Rs. 189. Another ladies' society has started well in Calicut and two lady organizers are to be appointed to organize more societies for women. A society has recently been started (in May 1935) in Tiruparungadu in North Arcot district with the objects of improving the button-making industry and providing a subsidiary occupation for the villagers.

There are now in Malabar two coir workers' and one mat-makers' society. These societies are dormant, but attempts are being made to revive them.

On 30th June 1935, there were 19 labour contract societies, none of them doing much work.

United Provinces.—The work of the Blanket Weavers' Society at Najibabad (Bijnor) showed some progress, and the quality of its products has improved.

The Co-operative Weaving Factory at Sandila (Hardoi) sold about one lakh yards of jaconet cloth to the Bihar and Orissa Government and the United Provinces Government Central Press in 1934, and secured similar orders in 1935.

The Durrie Makers' Societies at Agra produced durries of superior quality, but their business and profits continued to be small owing to inadequate demand.

Other societies for artisans worked indifferently.

128 Government Assistance to Industry (paragraph 504).

Bihar and Orissa.—The seven weaving and one dyeing demonstration parties with eight supervisors and fifty-six mistries continued to tour in the villages and to introduce improvements in hand-weaving, dyeing and printing industries. An eri seed supply station was started at Ranchi to supply disease free eri seed eggs to rearers of the province. The Silk Institute at Bhagalpur also rendered similar assistance to rearers. The blanket weavers of the province, who are also agriculturists, continued to receive technical advice from the Wool Weaving Institute at Gaya and the weaving parties of Gaya and Patna.

Central Provinces.—The rules under the Central Provinces State Aid to Industries Act, 1933, (XII of 1933), were issued and the Act was brought into force in the Central Provinces on the 1st September 1934 and in Berar on the 1st January 1935.

Delhi.—(i) The Government Cottage Industries Institute, Delhi, the first of its kind in this province was established in 1935 with a grant from the Government of India. No tuition fee is charged and free accommodation is provided in the hostel.

The proposals for the introduction of a measure of State aid to industries has been rejected, while a scheme for the appointment of a village Demonstration Party is under consideration.

(ii) Demonstrations were organized in sheep-rearing and improvement of wool by cross-breeding at the annual rural exhibitions.

(iii) The practical demonstrations of various forms of cottage industries given at the annual rural exhibitions and the Silver Jubilee village exhibition were much appreciated by the villagers.

Madras.—Hand-loom weaving industry.—There is at present no occupation so remunerative as weaving to absorb the population not engaged in agriculture, or to keep the agriculturists occupied during the slack season. The announcement by the Government of India of their decision to assist, by the grant of a subsidy, schemes drawn up by Local Governments for developing co-operative buying and selling on behalf of the hand-loom weavers and generally for the better organization and improvement of the hand-loom weaving industry was, therefore, greatly welcomed. The scheme prepared by this department and approved by the Government of India, provides for the setting up of a Central Weavers' Co-operative Society at Madras, with a number of district primary production societies linked to it. The production societies will be assisted by the central society in securing supplies of raw materials such as yarn, dye-stuffs, chemicals and also improved appliances and designs, and in disposing of the surplus stock of goods left over after local sales. The grant allotted to this Presidency was Rs. 20,500 for 1934-35 and Rs. 59,500 for 1935-36. In pursuance of the scheme, a Provincial society was formed under the name of "The Madras Handloom Weavers' Provincial Co-operative Society" and it was registered under the Madras Co-operative Societies Act No. VI of 1932 with an authorized share capital of Rs. 5,00,000 divided into 10,000 shares of Rs. 50 each. With a secretary, a marketing officer and a few supervisors of production on societies, the Provincial society commenced work in the latter part of 1935.

Sericulture.—This section is maintained solely for the benefit of the agricultural population, as sericulture is a useful cottage industry which can be taken up by the agriculturists as a part-time occupation in certain areas. Four silk farms for the production of seed cocoons and the improvement of the breed by hybridization are maintained. These farms serve as demonstration farms also. There is a peripatetic party of 12 moth testers, one rearer and one silk reeling demonstrator who tour about and examine microscopically the seed cocoons for silk worm rearers. Rational methods of rearing and improved methods of silk reeling are also demonstrated to them. During the year 1934-35, 9.61 lakhs of layings of seed were tested for the rearers.

The Government of India have given a grant for the purpose of increasing the production and supply of disease free "cellular" seed to the silk worm rearers of the Presidency and for the conduct of research on silk worm diseases. This scheme has recently been given effect to. A recent development in sericulture has been the preparation of gut from mature silk worm glands.

Starches.—In view of the fact that starch finds a variety of applications in art and manufacture, especially in textile industries, experiments were undertaken with a view to ascertaining the possibilities of producing suitable starch which could replace the imported product. Small quantities of rice, jowar and ragi starches were prepared at the Indian Institute of Science and sent to a large textile manufacturing company which, as a result of laboratory tests, selected the ragi and jowar starches as likely to be the most suitable for their requirements. In order, however, to enable the company to arrive at a definite conclusion, a 3-cwt. sample of jowar starch was sent and, as a result of large scale trials carried out by them, the starch has been pronounced suitable for use in the textile industry. Attempts are now being made to simplify the method of preparing the starch.

Slate industry.—A demonstration of the working of the locally constructed machines for the manufacture of school slates was staged in the Government Industrial School, Bellary, for the benefit of the slate workers of Markapur where the manufacture of school slates has been carried on. Subsequently, the proprietor of the Standard Furniture Works, Kallai, adopted the suggestion of the department that slates might be taken to localities other than Markapur for framing and has set up machines for preparing the frames, polishing the slates and turning out the finished product at Kallai.

Groundnut decorticator.—Experiments were carried out with a view to the evolution of a suitable hand-operated groundnut decorticator, so that, if a suitable and inexpensive machine could be produced, it might be employed to lighten ordinary agricultural labour and add to the earning power of the ryot. As a result of the experiments, a machine has been constructed and found to be satisfactory.

Ceramic industry.—The final report on the ceramic survey of the Presidency, which was published during the period, goes to show that there are possibilities of developing the manufacture of certain ceramic goods as valuable deposits of China clay and felspar have been discovered, whilst other raw materials required for the manufacture of porcelain and other ceramic goods such as stoneware, drainage pipes, electric insulators, etc., are available. The question of the further steps that could suitably be taken to develop the industry is now engaging the attention of the department.

Madras cottage industries.—In view of the importance of developing cottage industries the Government accepted the offer of the Victoria Technical Institute, Madras, to arrange for the sale of Madras industrial products in European markets through an Agent in

London, and for this purpose sanctioned a grant of Rs. 8,000 per annum to the institute for a period of three years from 1934—35. Business has been regularly transacted and, although it is too early to judge what results can be expected from this arrangement, it is hoped that a substantially increased demand for the products of the cottage and small-scale industries of Madras will eventuate, as the agent in London is transacting a satisfactory volume of business in Bihar and Orissa products which he has been handling for some time past.

Possibilities of industrial development at Mettur.—An investigation was carried out in regard to the possibilities of attracting industries to Mettur and in a report submitted to Government was reviewed the scope for development in the Mettur area of various industries including cotton spinning and weaving, manufacture of rayon and fibre, manufacture of vegetable product and hardened oil by the hydrogenation process, the alkali industry, manufacture of steel from Salem iron ores, and paper and pulp manufacture. Negotiations are in progress with private interests with a view to the establishment of some of these industries, and analyses of the requisite raw materials are being conducted.

State aid to industries.—A loan of Rs. 500 under the State Aid to Industries Act was disbursed during the period for the purpose of starting a coir factory on a small scale in the Tanjore district. Another loan of Rs. 50,000 to a sugar mill in the East Godavari district was recommended by the Board of Industries, and has since been sanctioned by Government. As it is considered that during the period the Act has been in force, it has not achieved any measure of success in stimulating industrial development, the question is under consideration of amending the Act or the rules, or of taking such other action as might make the Government's policy in the matter of industrial finance more effective.

United Provinces.—The Provincial Department of Industries continues to pay special attention to the development of small industries. Various experiments were undertaken at Government institutions in connexion with industrial development.

A survey of the handloom weaving industry of the province was also undertaken, and a central marketing organisation for handloom products started.

Schemes have been framed for marketing the products of village industries through subsidized shops and the United Provinces Arts and Crafts Emporium, Lucknow, for the marketing of ghee through co-operative societies and subsidized trade associations, and for the development of selected village industries, by means of co-operative stores, *e.g.*, basket making and needle work for women; leather tanning and hide curing, brass utensil making and casting; blanket weaving and durrie weaving.

A shop called the "Bee Hive" has also been established at Naini Tal by a number of ladies, under the guidance of Lady Haig, for the sale of the product of cottage industries, and a needle work guild has also been started by them in Lucknow.

129. *Qualifications of Directors of Industries (paragraph 505).*

United Provinces.—The post of Director of Industries is at present held by an Indian Civil Service Officer.

130. *Encouragement of Migration (paragraph 509).*

United Provinces.—The only portion of the province to which migration could be encouraged, if health conditions were improved, is the Tarai and Bhabar area; no arrangements for improving health conditions here could be made owing to financial difficulties.

CHAPTER XVII.—Horticulture and Plantations.

131. *Development of the Cultivation of fruit and vegetable with special reference to Picking, Packing, Transport and the use of suitable containers, the establishment of Regulated Markets and improvement of marketing conditions generally (paragraphs 514—517).*

Andamans.—The Department maintains a small experimental fruit garden where imported fruit trees of various species are tried with a view to propagating those which do well under local conditions. During the past the activities of the garden have mainly been directed at propagating those plants which have proved satisfactory and at planting these up in the garden with the object of providing material for increased propagation and for distribution to small growers.

Baluchistan.—This line of work is receiving special attention and considerable amount of information is available for the benefit of growers. Marketing has received hardly any attention at all worth mentioning.

Bengal.—The horticultural work at Krishnagar under the scheme financed by the Imperial Council of Agricultural Research for the development of orchards in the plains of Bengal was continued.

Bihar and Orissa.—Consignments of Bihar mangoes were sent to the Fruit Research Officer, Poona, to investigate their export possibilities under cold storage.

Trial consignments of Bihar mangoes were sent to Calcutta and Delhi to find out their keeping qualities under the existing railway transport conditions and their market possibilities in these places.

Bombay.—In the Presidency proper selected strains of indigenous fruits are found to be superior to local strains. There is growing demand for the cultivation of the selected strains, particularly that of Guava.

The Committee on the Improvements in the Marketing of Fruit and Vegetables in the town of Bombay has made recommendations for improving the present system of marketing and disposal of fruit. The growers will be benefitted by the introduction of some of these improvements.

The Agricultural Department has now in hand pure strains of brinjal and chilly. The yield trials are being laid out. The cold storage investigations on mango and santra are nearing completion. This work is extended to other important fruits also.

In Sind this work is making progress at the Government Fruit Farm, Mirpurkhas. The marketing of fruit in Sind has been investigated by an Assistant Marketing Officer.

Central Provinces.—A scheme for research work on citrus fruits has been submitted to the Imperial Council of Agricultural Research. The scheme has been sanctioned by the Council and is now awaiting allotment of funds. The question of better marketing and transport of oranges has been taken up by the Deputy Director of Agriculture, Economics and Marketing. Trial consignments of oranges have been sent to foreign countries. An orange growers' association has been formed and financial assistance is given to the association by Government to facilitate marketing of oranges. The work of the association is being carried out under the direct supervision of the officers of the Agriculture Department.

North-West Frontier Province.—The Department markets the fruit of Tarnab Farm to the value of Rs. 30,000 a year and has built up a private order trade which amounted to Rs. 11,000 in 1935. Valuable information has been obtained regarding packing, standardization of containers, carriage of fruit by rail marketing facilities in the principal towns in India. A census is being carried out of all the orchards in the Province. The question of the reduction of railway freight on fruit has been taken up with the North-Western Railway and a substantial concession has been obtained.

Punjab.—Fruit culture is spreading rapidly. The Fruit section of the Agricultural Department has been strengthened by the appointment of an Assistant Fruit Specialist and two Gazetted Forest Officers not required by the Forest Department. Research into the preservation of fruit and preparation of fruit products is being conducted by a Bio-Chemist appointed temporarily from funds provided by the Imperial Council of Agricultural Research, and the marketing of fruit is being studied by the marketing staff financed jointly by the Punjab Government and the Imperial Council of Agricultural Research.

United Provinces.—The hill fruit research scheme financed by the Imperial Council of Agricultural Research is in operation and is carrying out important researches.

The membership of the United Provinces Fruit Development Board is 360, with affiliated district associations. The Board has rendered definite assistance to the cause of fruit growing. Special mango shows were staged and useful literature issued.

A fruit expert has been appointed recently.

132. *Work of Agricultural Departments in the selection and classification of Root-stocks (paragraph 518).*

Baluchistan.—This is a most important line of work. A scheme for this was submitted to the Imperial Council of Agricultural Research who recommended to the Government of India that Rs. 1,000 per annum should be provided for this work but this has not been done.

No definite results are expected until the problem is handled boldly and money is forthcoming for it.

Bihar and Orissa.—Remarks under item 131 may be seen.

Bombay.—In the Presidency proper no systematic work is being done on the improvement of root stock.

In Sind experimental work in this connection is in progress at the Government Fruit Farm, Mirpurkhas, and at the Fruit Sub-station at Larkana.

North-West Frontier Province.—Experimental work, mainly in connection with Citrus, peach, plum and apricot is being continued.

Punjab.—The Agricultural Department is now in a position to recommend specific varieties of many of the most important fruits. It now remains to produce sufficient nursery plants of these varieties to meet the demand for them, and for this purpose the Government of India have given a grant for the provision of a large number of reliable nursery fruit plants for sale to public at cheap rates. A fruit preservation plant on a semi-commercial scale for experimental purposes and to afford facilities for instruction in fruit preservation will be ready shortly. Preliminary work in connection with a scheme of research on citrus stock and grape vines in the Punjab to be financed by the Imperial Council of Agricultural Research is progressing.

✓ The marketing staff is studying the market conditions of fruit.

United Provinces.—Different apple stocks are being tried at Chaubattia, and notes kept on stocks possessing desirable characteristics, and those that will be immune to the wooly aphids.

Work at the Saharanpur gardens has indicated the value of the citrus.

183. *Experimental work by Agricultural Departments on fruit and vegetables (paragraph 519).*

Assam.—Work on citrus and deciduous fruits continued on the lines previously reported.

Baluchistan—Considerable work on the classification and selection of local varieties of fruit has already been done. Foreign varieties of outstanding merits have been introduced from England, California and France and are under trial. Information as regards best varieties of different vegetables is available. It has definitely been proved that under Quetta conditions $\frac{1}{2}$ acre under best varieties of tomatoes is capable of bringing upto Rs 1,000.

Bengal.—Apart from the horticultural work at Krishnagar, experiments on fruits and vegetables are being systematically carried out at the Kalimpong and Rangamati farms.

Bihar and Orissa.—Remarks under item 181 may be seen.

Bombay.—The Ganeshkhind Botanical Gardens is now styled the Ganeshkhind Fruit Experiment Station. All plantations are growing well. The manurial and irrigation experiments are laid out.

North-West Frontier Province.—Californian varieties of fruit introduced in the past have proved so successful that further extensive trials are being made.

Punjab.—See remarks against item 182.

United Provinces.—Cold storage trials of mangoes were undertaken, and a consignment was sent to England. Experiments continue on shield and patch budding, gooty, layering of mangoes; enarching on young stock has also been done. Custard apple was enarched and budded. Fruit diseases and pests were studied. Work on vegetables was also conducted. Rejuvenation of old orchard trees was taken up. The question of the marketing of fruits is being looked into by the Marketing Officer.

184. *Recording of marketing information by Marketing Officers and Agricultural Departments (paragraph 519).*

Bengal.—The staff employed under this department in connection with the marketing scheme of the Imperial Council of Agricultural Research is now busy in making a marketing survey and information is being collected regarding a number of different commodities.

Bihar and Orissa.—Remarks under item 181 may be seen.

Central Provinces.—This is now being done by the marketing staff working under Government of India Marketing Scheme under the supervision of the Deputy Director of Agriculture, Economics and Marketing.

N.-W. F. P.—The Marketing Officers appointed in 1931 are engaged in this work.

Punjab.—See remarks against item 182.

United Provinces.—The recording of marketing information will shortly be taken up by the Provincial Marketing Officer.

185. *Encouragement of Private Enterprise in establishing Nurseries for Orchard Stock and production of Vegetable Seeds (paragraph 519).*

Baluchistan.—A number of private fruit nurseries has been established all over the country but the methods employed are largely out of date.

Bengal.—High class English vegetable seeds are sold in packets by this department at a low price. At the instance of this department the railway companies have fixed quarter parcel rates for the transport of grafts and plants.

Bombay.—The large number of nurserymen in this Presidency have agreed to get themselves registered and follow the recommendations of the Agricultural Department. Draft proposals for the registration of nurserymen have been circulated by the Department to nurserymen.

In Sind twelve subsidiary orchards and nurseries have been established on selected cultivators' lands and are managed under the supervision of the district staff and the Horticulturist.

N.-W. F. P.—Many zamindars have now taken up nursery work and use men trained by the Agricultural Department for budding and grafting. These nurseries are selling plants very cheap, but the absence of any control over them makes them of doubtful advantage. It is considered that legislation to control nurseries would be premature at present.

Punjab.—The formation of the Punjab Provincial Co-operative Fruit Development Board, with prominent Fruit growers as office bearers, has given a stimulus to the encouragement of private enterprise in establishing nurseries for orchard stock. District Fruit Growers Associations, which are being formed, will be affiliated with the Central Board.

United Provinces.—Private nurseries already exist, and new ones will be helped by the Fruit Development Board.

CHAPTER XVIII.—Statistics.

136. *Preparation of Forecasts of Yield in the Central Provinces and Burma (paragraph 525).*

No remarks received from the local Governments concerned.

136-A. *Fuller information regarding wells should be given in the irrigation reports (paragraph 525).*

United Provinces.—Statistics of well irrigation are included in the annual irrigation administration reports.

137. *Improvement of Crop Statistics in Bengal, Bihar and Orissa and Assam (paragraph 527).*

The Royal Commission recommended that the correctness of the formulae used in arriving at the areas under mixed crops should be tested from time to time by actual field trials of the main types of mixtures found in a district.

United Provinces.—It is proposed to take up this question after gaining a little more experience of the results of the new methods of crop cutting experiments introduced during the past 3 or 4 years.

The question of mixed crops will be taken up later.

138. *Crop cutting Experiments (paragraph 528).*

Baluchistan.—No change has been made in the existing practice.

Bombay.—No action has been taken during the period under review with regard to this recommendation except for giving publicity to the All-India crop forecasts through the medium of the vernacular press.

N.-W. F. P.—All crop cutting experiments in connection with revenue work are carried out by the Agricultural Department.

United Provinces.—The new system of crop cutting experiments to ascertain the yield of different crops continued in four districts and has been extended to five more districts.

138-A. *All vital and health statistics should be shown separately for rural and urban areas (paragraph 535).*

United Provinces.—Vital and health statistics are shown separately for urban and rural areas.

139. *Appointment of a Statistical Assistant to the Provincial Agricultural Departments (paragraph 538).*

Bombay.—The remarks under item 138 apply to this recommendation also.

Central Provinces.—No such appointment has yet been made. A member of the staff of Agricultural College was sent to Calcutta for special training in statistics.

Madras.—Please see report for the year ending 31st December 1933. It has since been decided to place the statistical officer now working under the Board of Revenue under the Provincial Director of Industries.

United Provinces.—See remarks against item 40.

140. *Appointment of Provincial Statistical Officers (paragraph 538).*

United Provinces.—The Director of Industries is the Director of Statistics and is in charge of a Bureau of Statistics; in addition a whole-time statistician is maintained, who works as Executive Officer of the Bureau.

141. *Use of Non-official agencies in collection of Agricultural Statistics (paragraph 541).*

Bombay.—The remarks under item 138 apply to this item also.

United Provinces.—The Bureau of Statistics and Economic Research continued to function. Non-official agencies are not yet available for systematic collection of statistics though their services are occasionally utilized.

CHAPTER XIX.—The Agricultural Services.

142. *Qualifications, pay and status of Directors of Agriculture (paragraph 547).*

Assam.—A temporary post of Director of Agriculture was created for two years from 16th May 1934 and was held by a qualified member of the Indian Agricultural Service.

United Provinces.—The post of Director of Agriculture continues to be held by an officer of the Indian Agricultural Service with the requisite qualifications.

143. *Qualifications, pay and status of Principals of Agricultural Colleges (paragraph 517).*

Madras.—The Principal when he is a member of the Provincial Service will be given a special pay of Rs. 100 in addition to his grade pay.

United Provinces.—The post of Principal is held by an officer of the Indian Agricultural Service.

144. *Recruitment to and Organisation of the new Superior Provincial Agricultural Services (paragraphs 549—556 and 568).*

Bengal.—The cadre of the Bengal Higher Agricultural Service now consists of the following posts:—

- (1) Deputy Director of Agriculture, Western Circle.
- (2) Deputy Director of Agriculture, Northern Circle.
- (3) First Economic Botanist.
- (4) Second Economic Botanist.
- (5) Agricultural Chemist.

Bihar and Orissa.—The New Superior Provincial Agricultural Service has been created with effect from April 1935.

Punjab.—Appointments to 5 posts in the cadre of the newly constituted Superior Provincial Agricultural Service have been made.

United Provinces.—Rules for the recruitment of officers to the Superior Provincial Agricultural Service have been issued and are in operation since 1st October 1934. Most of the recommendations made in paragraphs 549—556 have been incorporated in the rules.

145. *Interchange of officers between Provinces for Study of special problems (paragraph 557).*

Central Provinces.—Necessity for such change has not yet arisen.

United Provinces.—There was no occasion for the interchange of officers during the last two years, but the Director of Agriculture was serving in the Central Provinces before his appointment as Director in this province.

146. *Grant of Study Leave to officers of new Superior Provincial Agricultural Services (paragraph 559).*

Bombay.—Study leave was granted to an officer of the Provincial Agricultural Service, Class II, *viz.*, the Assistant Professor of Dairying, for training overseas in America and Europe in animal husbandry problems.

United Provinces.—No study leave was granted to any officer during the last two years. It will be allowed if and when necessary.

CHAPTER XX.—Miscellaneous.

147. *Establishment of Local Self-Government Institutes (paragraph 576).*

Central Provinces.—The matter has been examined by a Committee appointed by Government in 1935 to overhaul Local Self-Government in the province. The recommendations of the Committee are under Government's consideration.

United Provinces.—It is not feasible to establish a Local Self-Government Institute in the province at present.

148. *Establishment of meteorological stations of the "Second Order" on experimental farms in areas in which climatic conditions are of importance (paragraph 577).*

Bihar and Orissa.—There is nothing to add to the previous report except that complete meteorological equipments have now been installed at the Rice and Sugarcane Research Stations.

United Provinces.—A meteorological laboratory has been fitted and equipped at the Agricultural College, Cawnpore; an official of the Department has received the requisite training at Poona.

